

BENJAMIN[®]

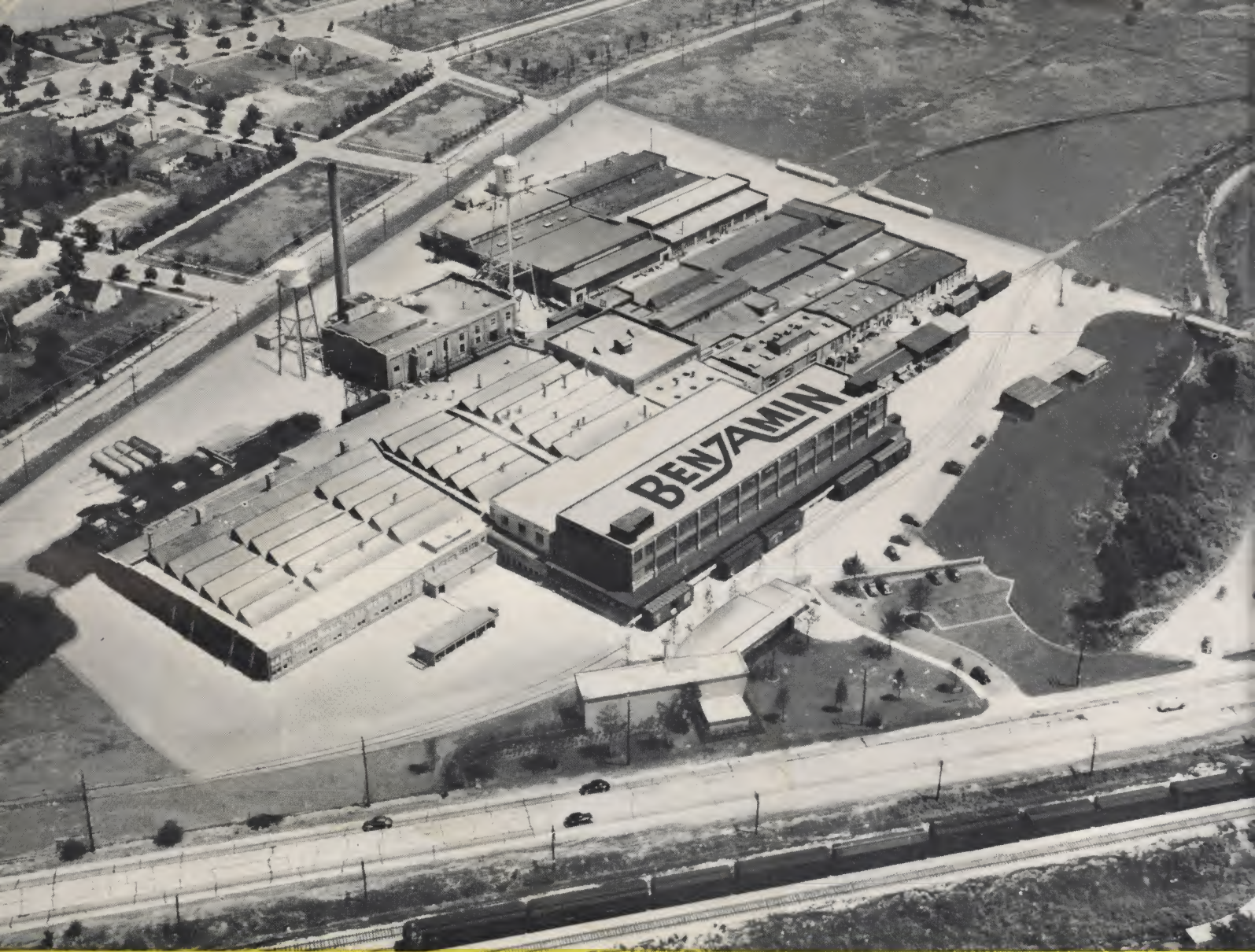


Fluorescent
Lighting
Systems

for
**INDUSTRIAL AND
COMMERCIAL
LOCATIONS . . .**

More than a half century's experience
producing Lighting Equipment

Bulletin **fe**



Aerial view of Benjamin's plant.

From sheet steel
and other raw products...
to finished, dependable lighting
equipment... this large, modern
plant enables Benjamin experts
to maintain complete control
over design and production.



Entrance to reception room.

Location of Benjamin DISTRICT REPRESENTATIVES

Issued August 1952

ATLANTA, GEORGIA

285 Lakemoore Drive
J. T. Birch Addington
CHEROKEE 9352

BALTIMORE 12, MARYLAND

2 Murdock Road
John M. Asher
TOWSON 4426

BOSTON 10, MASSACHUSETTS

10 High Street, Room 521
James S. Patrick
George B. Almy
LIBERTY 2-3982

CHARLOTTE 2, NORTH CAROLINA

139 Brevard Court
D. Mack Woodside
Daniel Barcik
2-0298

CHICAGO SALES OFFICE

20 North Wacker Drive
Chicago 6, Illinois
Ivar H. Stackel*
Fred Stranberg
Robert J. Mors
Thomas F. Jordan
Robert F. Klingel
STATE 2-5197

CINCINNATI, OHIO

3845 Kilbourn
William A. Gale
EAST 7004

CLEVELAND, OHIO AREA

20856 Fairpark Drive
Fairview Park 26, Ohio
Louis J. Cahill
ORCHARD 1-6518

DALLAS 2, TEXAS

P. O. Box 5053
Ralph Heitzman
WOODLAWN 9509

DENVER 4, COLORADO

1140 Speer Boulevard
The James H. Blinn Company
KEYSTONE 8131

DETROIT, MICHIGAN AREA

P. O. Box 6098
Southwestern Branch
Dearborn, Michigan
F. Lee Davis
LOGAN 3-0030

GRAND RAPIDS, MICHIGAN

P. O. Box 87
Burton Heights Station
Lawrence A. Niemeyer
CHERRY 1-3224

HARTFORD 1, CONNECTICUT

P. O. Box 252
Joseph T. Osterby
NEWINGTON 6-4308
(Newington, Conn.)

HOUSTON, TEXAS

P. O. Box 2221
Curt Grevelius
MOHAWK 4066

INDIANAPOLIS 20, INDIANA

1037 W. 52nd Street
Arthur H. Wiese
BROADWAY 4312

LOS ANGELES 13, CALIFORNIA

923 E. Third Street
George A. Hochenauer
James H. Kersbergen
MADISON 6-6076

MILWAUKEE, WISCONSIN

5511 N. Kent Avenue
Edward M. Reid
WOODRUFF 2-2159

MINNEAPOLIS, MINNESOTA

4945 Penn Avenue South
Raymond S. Meyers
WHITTIER 1372

NEW ORLEANS, LOUISIANA

5454 Orlando Drive
Jefferson Parish
Frank R. Reindl
CEDAR 0488

NEW YORK SALES OFFICE

230 West 17th Street
New York 11, New York
Raymond E. Corwin*
Arnold Schmeidler
Arthur H. Brooke
Warren J. Prediger
Warren Hastings
WATKINS 9-3284

NEWARK, NEW JERSEY AREA

P. O. Box 13
River Edge, New Jersey
George H. Krueger
ORADEL 8-2979

PHILADELPHIA, PENNSYLVANIA

P. O. Box 22
Westerman McCouch
IVY RIDGE 2-1059

PHOENIX, ARIZONA

340 E. Virginia Avenue
Ritsman Campbell

PITTSBURGH 11, PENNSYLVANIA

435 Olympia Road
Carlton Ostrom
HEMLOCK 1-2530

ROCHESTER, NEW YORK

165 Lehigh Avenue
Carl H. Pollack
GENESEE 6132

SALT LAKE CITY 1, UTAH

318 Dooly Block
Leonard M. Slusser
5-2322

SAN FRANCISCO SALES OFFICE

829 Folsom Street
San Francisco 7, California
Carl O. Martin*
John E. Keyes
Harvey F. Christensen
DOUGLAS 2-6246, 2-6247

SEATTLE 6, WASHINGTON

3018 45th Avenue S. W.
Henry R. Huber
WEST 0479

ST. LOUIS, MISSOURI

367 Paul Brown Building
Oliver C. Westberg
CENTRAL 6982

*Division Sales Manager

Benjamin Electric Mfg. Company

Des Plaines, Illinois

NEwcastle 1-3300 (Chicago Exchange)

VAnderbilt 4-3141 (Des Plaines)

PRESIDENT: Walter D. Steele

EXECUTIVE VICE PRESIDENT: Hoyt P. Steele

SALES: J. Horton Fall, III (Vice President and General Sales Manager)
Arthur E. Swedenborg (Assistant General Sales Manager)

ADVERTISING: Frank A. Callahan (Advertising Manager)

SALES PROMOTION: James R. Chambers (Sales Promotion Manager)

SERVICE AND ORDER DEPT: Herbert G. Krenz (Sales Service Manager)
George Luebke, Sr. (Assistant Sales Service Manager)

TRAFFIC: Arthur G. Olson (Traffic Manager)

ENGINEERING: Edward R. Chappell (Assistant Chief Design Engineer)

ILLUMINATING ENGINEERING: Benjamin Scott Benson, Jr. (Chief Illumination Engineer)

LABORATORY: Eric H. Church (In charge of Laboratory)

Benjamin Fluorescent Lighting Equipment *

*Reprinted from Sections 13, 13-A, 14, 14-A of
the Benjamin General Catalog. Page numbers
and references are based on this catalog.

For CURRENT PRICES, see current "Fluorescent Net Price List" and Supplement.
List prices shown on the pages of this bulletin are not necessarily up-to-date.

The Benjamin Electric Mfg. Company

Its Home, Laboratory and History

HOME OF BENJAMIN ELECTRIC

The plant and general offices of the company are located at the northern end of the city of Des Plaines, Illinois, a Chicago suburb with a population of approximately 15,000 located about 20 miles northwest of Chicago's loop and about 5 miles from the new Chicago airport, O'Hare Field.

The company owns 77 acres of land, 6 acres of which are occupied by its buildings and yard area. Most of its employees live in Des Plaines or adjacent suburban communities.

LABORATORY

Benjamin's modern, new laboratory, completed in 1945, was built to fill long-felt needs—to test and apply new findings in basic research and to provide more accurate quality control for Benjamin products. Late developments in illumination, ceramics and metallurgy are thoroughly examined by the Benjamin Product Development and Testing Laboratory for possible use in new, better electrical products or for improvement of existing products. At the same time, it provides further assurance to the users of Benjamin equipment that they are getting uniform, high quality.

BENJAMIN'S HISTORY

The company was founded in June, 1901 by Reuben B. Benjamin, who was joined by W. Clyde Jones, Keene H. Addington and W. D. Steele, who is now the active head of the Benjamin organization. The company started in a

small way with a single product, the Wireless Cluster, one of the earliest inventions of Mr. Benjamin. In those days these Wireless Clusters made it possible for the first time to secure adequate illumination in an economical way. Some of these Clusters are still being manufactured and during the war were widely used in the manufacture of Cargo Lights for the Maritime Commission.

Subsequently, Mr. Benjamin developed and patented the reflector now known as the "RLM Dome Reflector" which is still the standard of incandescent industrial lighting equipment for industry. Another development was the Elliptical Angle Reflector and other porcelain enameled steel reflectors now widely used.

In the earlier days the bulk of these porcelain enameled steel reflectors were made by Royal Enameling and Manufacturing Company which was started in 1908 at the present site of the Benjamin Electric Mfg. Company. As time went on, the interests of these two firms became so closely identified that in 1918 they were merged and the combined organizations continued under the name of Benjamin Electric Mfg. Company.

In March 1929, the general offices and all factory departments still remaining in Chicago were moved to the Des Plaines plant.

In the second generation of existence, the company is still actively headed by one of the founders, W. D. Steele, as President, who is assisted by a Board of Directors composed of the sons of the founders.



Benjamin Product Development and Testing Laboratory

Products and Channels of Distribution

BENJAMIN PRODUCTS

The Benjamin line is the most complete in its field. At the present time the Benjamin Catalog utilizes over 400 pages to illustrate and describe the basic electrical lines of Benjamin products. These lines include incandescent and fluorescent lighting equipment for industry and commerce, outdoor and indoor floodlights, industrial call and warning signals, and electric wiring specialties.

The Benjamin Trade Mark has come to stand for lighting units that comply with all recognized illumination, electrical and mechanical standards and applicable RLM Specifications. Benjamin lighting products are widely used and favorably known in all classes of industry and commerce . . . on land and sea.

A list of the users of these products would begin with the United States Government, take in most of the names of well known industrial giants among the motor manufacturing companies, the railroads, the packing industry, etc., and reach into medium and smaller industrial and commercial organizations by the scores of thousands throughout this hemisphere and the rest of the world.

CHANNELS OF DISTRIBUTION

Benjamin lighting products are sold through the electrical wholesale trade by more than 500 distributors, and are usually installed by electrical contractors.

The manifold services rendered by Benjamin distributors, as sources of supply for Benjamin electrical products, include: Preparation of specifications, a responsible local source of supply, simplification of purchasing, authoritative information and recommendations on your electrical problems, and local service stocks.

The map shown here, with the various cities indicated by dots, gives a general idea of the national scope and location of the wholesale trade centers through which Benjamin products are distributed.

Three floors, embracing 60,000 square feet, at the Benjamin plant provide necessary warehousing facilities for more than 1,800 catalog items. This warehouse, with its own switching facilities, is centrally located with easy access to main railroads and highways—furnishing rapid, nationwide delivery and service. Divisional sales offices of the company, including branch warehouses in the Eastern and Western divisions, are located as follows:

Eastern Division:

New York 11, 230-234 West Seventeenth Street.

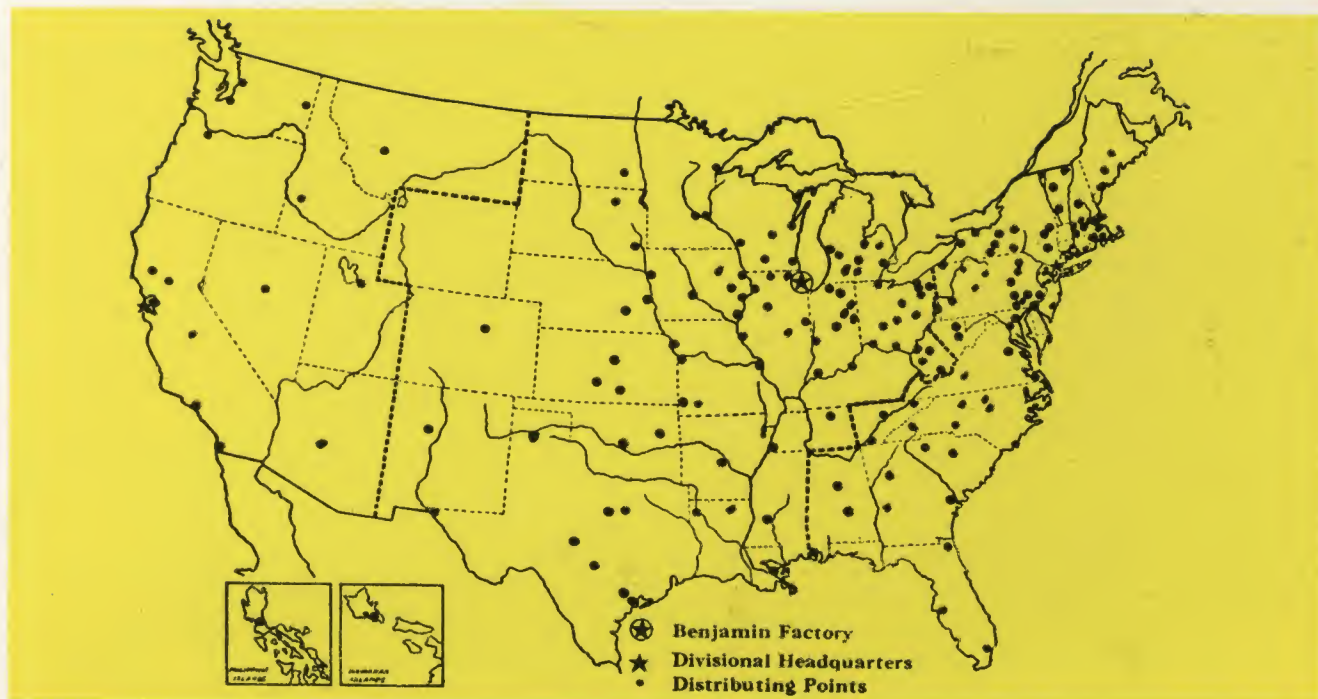
Western Division:

San Francisco 7, 829 Folsom Street.

Central Division:

Chicago 6, 20 North Wacker Drive.

An Export Department is maintained at the General offices. Representatives are located in the trade centers of Latin American and U. S. territories.



The Superiority of Porcelain Enamel

WHAT IS PORCELAIN ENAMEL?

Porcelain enamel is a mineral compound—a form of glass—that is first reduced to a molten mass, and then fused into the metal at extremely high temperatures in the neighborhood of 1400 degrees Fahrenheit.

Because porcelain enamel is made exclusively from mineral matter, it is an inorganic substance, and almost without exception inorganic or mineral compounds are infinitely more stable from a chemical and physical standpoint and are, generally, not affected by the processes that break down finishes of the organic type such as paint.

From milling the raw materials to spraying and firing the finished reflectors, every step in the porcelain enameling of

Benjamin lighting equipment is done in the Benjamin plant under the constant supervision of specialized Quality Control technicians.

This Quality Control results in higher and more uniform quality possible only under a system of undivided responsibility. Nothing is spared in securing the very best ingredients in the preparation of Benjamin Lifetime porcelain enamels; and the most modern methods and equipment are used in their application.

Special service enamels supplied on particular Benjamin lighting equipment include a diffusing mat enamel which reduces specular reflection, and an acid-resisting enamel introduced for equipment used in severe service conditions conducive to corrosion.

PORCELAIN ENAMEL IS THE IDEAL REFLECTOR FINISH

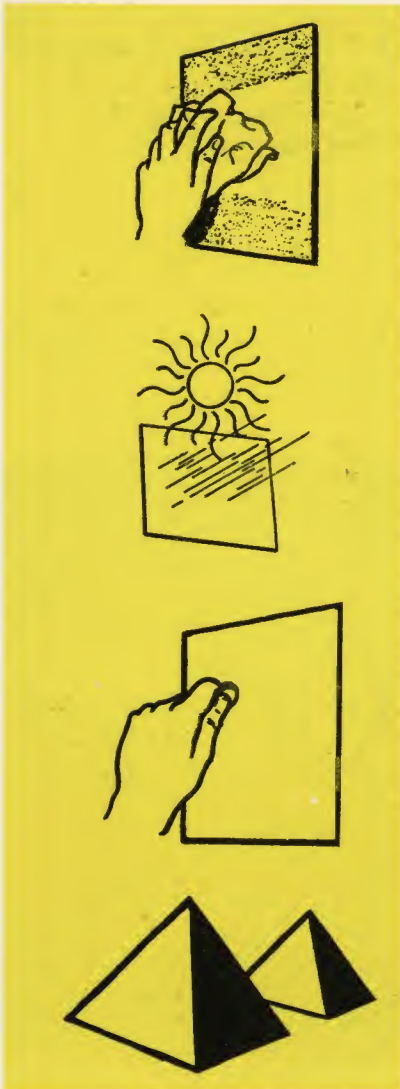
Porcelain Enamel Is Easy to Clean—Porcelain enamel may be restored to its original condition by washing with soap and water. After five years, ten years, twenty years, or a lifetime, porcelain enamel is the one finish that retains its original whiteness. Unlike other reflector finishes, porcelain enamel may be maintained at its original light reflecting efficiency.

Porcelain Enamel Stays White—Because porcelain enamel does not deteriorate when in contact with chemicals found in most industries, it retains its whiteness. This stability is assurance that lighting equipment will retain its original efficiency for greater lengths of time.

Porcelain Enamel Is Weatherproof—Modern porcelain enamel successfully resists the most severe weather conditions such as climatic changes, humidity, corrosion, or other adverse atmospheric conditions.

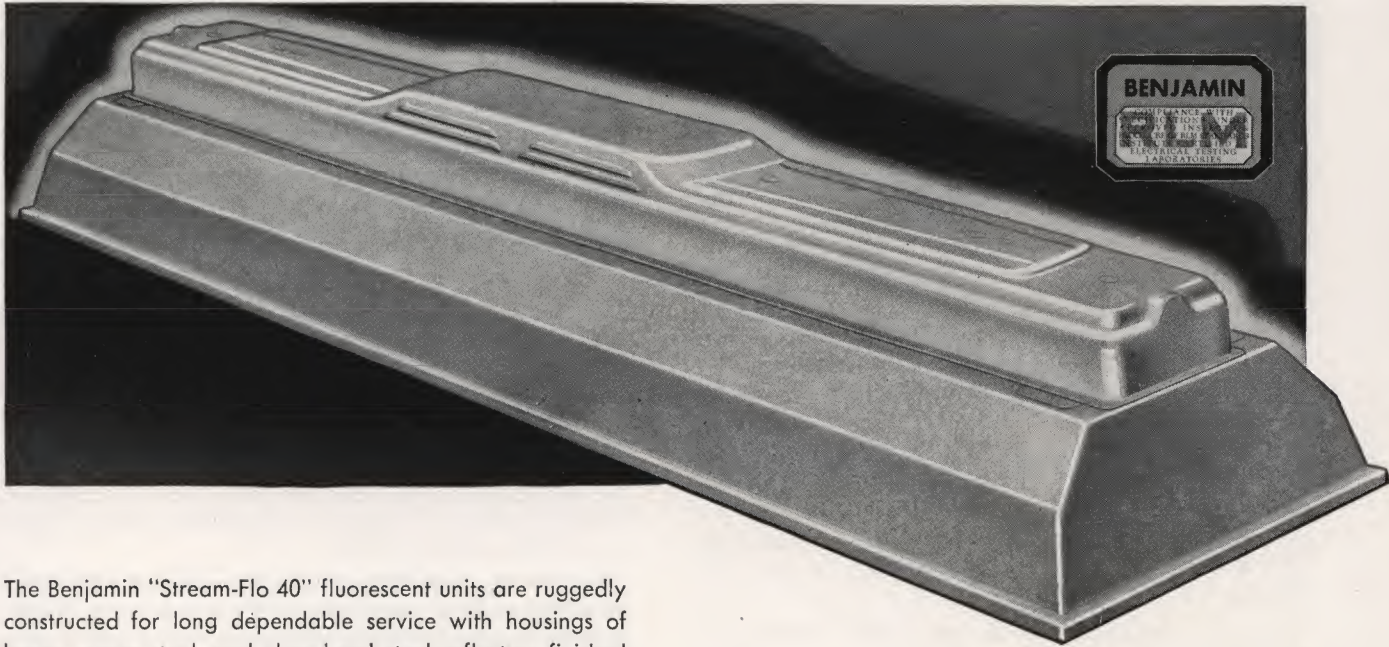
Porcelain Enamel Will Not Scratch—Modern porcelain enamel resists scratching and retains its original luster even after hard abrasive service. With the high tensile strength and safety of iron and steel, porcelain enamel is economical.

Porcelain Enamel Is Durable—The hardness of glass combined with the strength of steel gives porcelain enamel products the durability needed for industrial lighting equipment.



Benjamin RLM "STREAM-FLO 40" Units

"Series 40" Porcelain Enameled Closed-end Units for
Two and Three 40-Watt Fluorescent Lamps



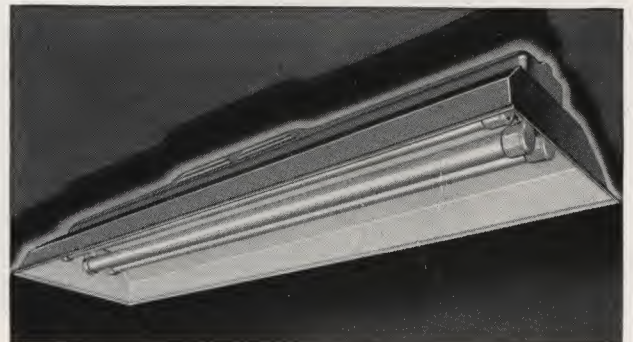
The Benjamin "Stream-Flo 40" fluorescent units are ruggedly constructed for long dependable service with housings of heavy gauge steel, and closed-end steel reflectors finished with Benjamin "lifetime" porcelain enamel. These smartly designed fluorescent units provide excellent general illumination for industrial and commercial locations, characterized by high lighting efficiency, a pleasing range of color quality, exceptional coolness and improved eye comfort. Engineering "know-how" and precision manufacturing methods insure correct reflector contour, adequate shielding of lamps and maximum light output.

"Stream-Flo 40" units are available in both twin and triple-lamp arrangements with conventional type ballasts employing either non-blinking or standard type starters. Twin-lamp units are also available with instant starting ballasts which require no separate starting equipment.

Separable Construction — The heavy-duty porcelain enamel steel reflectors are easily removed from the rugged steel housings by a quarter turn of two hand operated "LOK-LATCH" reflector fasteners. Ballast, and exclusive Benjamin "SPRINGLOX" safety type lamp holders are assembled to the steel housing, so that by simply removing the lamps, the reflector may be easily detached for cleaning without interfering with the wiring.

In installing the unit, the housing can be put up first and wiring connections completed. After that it is a simple mechanical connection to attach the reflector to the installed housing by a quarter turn of the "LOK-LATCH" fasteners.

Exclusive Benjamin Lamp Holders — Most noteworthy among the features of the "Stream-Flo 40" fluorescent lighting units are the exclusive Benjamin "SPRINGLOX" safety type lamp holders. These new safety type lamp holders offer a decided advancement in the ease of lamping and relamping fluorescent units and provide positive insurance against lamps dropping out. Lamp installation is the work of a moment. Simply slip one end of the lamp into the lamp holder equipped with a flexible spring base—this allows sufficient clearance for the contact prongs on the opposite end of the lamp to be slipped into the facing solid base type lamp holder. Pressure of the lifetime spring securely locks the lamp into position.



RLM "STREAM-FLO 40" Triple-Lamp Unit

(Issued September 19, 1949)

BENJAMIN • page 291

(From General Catalog)

Lighting Applications and Specifications

for Twin and Triple-lamp "STREAM-FLO 40" Units

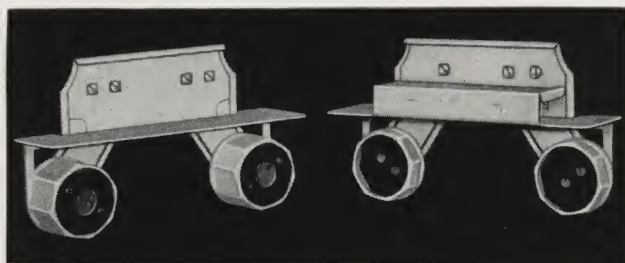
Lighting Applications

In general lighting installations, "Stream-Flo 40" units for two 40-watt (48-inch) fluorescent lamps provide lighting levels from 22 to 53 footcandles at normal mounting and spacing. "Stream-Flo 40" units for three 40-watt (48-inch) fluorescent lamps provide approximately 37% more light, increasing lighting levels to 31 to 70 footcandles. These values are based on the use of 3500° "white" fluorescent lamps.

Benjamin "Stream-Flo 40" fluorescent units are also widely used for local lighting. Mounted 30 to 36 inches above the working plane and equipped with "white" lamps, twin-lamp units can provide up to 100 footcandles. Under similar conditions triple-lamp units can provide up to 135 footcandles.

Light Output—The design of the reflector, high reflection factor (exceeding 82%) of the porcelain enamel, proper positioning of the lamps and other factors combine to give an efficiency of 80% or more of the output of the lamps for the twin-lamp type, and 76% or more for the triple-lamp type.

Spacing of Lamps—On twin-lamp units "SPRINGLOX" lamp holders are spaced on 5-inch centers. On triple-lamp units the outer lamps of the "SPRINGLOX" lamp holder assembly are spaced on 5-inch centers, the third lamp is centered between and slightly below the two outer lamps.



The exclusive Benjamin "SPRINGLOX" safety type lamp holders. These lamp holders are available in arrangements for two or three fluorescent lamps.

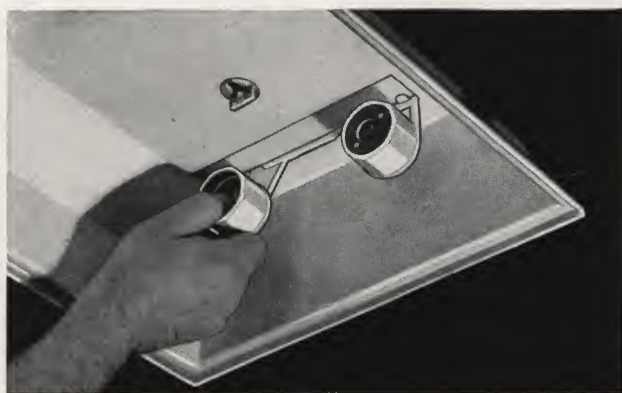
Shielding Angle—On twin-lamp units, when a line is drawn perpendicular to the reflector edge and tangent to the lower edge of the opposite lamp, this line forms a shielding angle of 13 degrees. Triple-lamp units also have a 13 degree shielding angle.

For further shielding on twin-lamp units, a white porcelain enameled longitudinal shield, which provides 27 degrees of crosswise shielding from the horizontal, is available. The longitudinal shield is easily and firmly positioned between the two lamps by means of two suspension arms which fit into two holes provided in the "LOK-LATCH" reflector fasteners. Longitudinal shield is listed on page 294, under Accessories.



Illustrating how reflector is easily attached or removed from the one-piece steel housing by a quarter turn of the two hand operated "LOK-

LATCH" reflector fasteners. An aluminum grommet protects reflector finish. Control equipment remains an integral part of the housing.



Illustrating the spring action of the Benjamin "SPRINGLOX" lamp holders. Lamp installation is the work of a moment. Simply slip one end of the lamp into the lamp holder equipped with a flexible spring base (illustrated above)—this allows sufficient clearance for the contact prongs on the opposite end of the lamp to be slipped into the facing solid base type lamp holder.

Specifications

Streamlined Housings—Ballast and exclusive Benjamin safety type lamp holders are mounted in the one-piece streamlined housing which is drawn from 20 gauge steel. Inner and outer surfaces are finished in gray enamel.

Porcelain Enamel Reflectors—Reflectors are made of porcelain enameling iron, completely covered with Benjamin "lifetime" porcelain enamel—outer surfaces are finished in gray, inner surfaces are reflecting white.

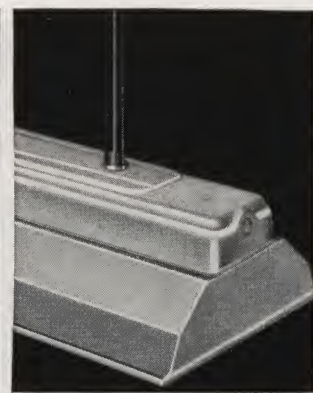
Ballasts and Starters—Twin and triple-lamp units are listed with conventional type, high power factor, ballasts. Twin-lamp units are also available with twin-lamp, high power factor, instant starting ballasts. On units with conventional type ballasts, a removable non-blinking type or a standard type starter is supplied for each lamp. Non-blinking starters eliminate blinking and flickering of dying lamps. All starters are easily removed for inspection or replacement.

Power Consumption—Twin-lamp units with lamps and conventional type ballasts use approximately 100 watts. Triple-lamp units with lamps and conventional type ballasts use approximately 150 watts. Twin-lamp units with instant starting type ballasts and lamps use approximately 110 watts.

Flicker—All ballasts operate the lamps out of phase to minimize cyclic light flicker.

Wiring—Units are furnished wired and come either with 6-inch leads or a 6-foot length two or three-wire cord and plug set. Two-wire cord sets have a standard two pronged plug and are approved for use on 110-125 volt service only. Three-wire cord sets have a two pronged plug with a wire coming out the side for grounding to the outlet box. Cord sets are wired to the unit.

Provision For Grounding—Metal-to-metal bond is provided between electrical units and housing for grounding.



Chain Mounting—Single (as shown) or double chain supports can be attached to each end of the housing by means of two detachable angle mounting brackets supplied with unit.

Conduit Mounting—Any one of three pairs of conduit knockouts in the top of the housing can be utilized for attachment of rigid conduit stems.

Methods of Suspension

Chain Mounting—Single or double chain supports can be attached to each end of the housing by means of two detachable angle mounting brackets, (spaced on 46 $\frac{3}{4}$ -inch center) supplied with the unit. Only welded or lock-link chain should be used for suspensions. For listing of such a suspension, see page 294, under Accessories. In wiring, lead-in wires can be brought into the top of the housing, using one of the six conduit knockouts provided.

Conduit Mounting—Any one of three pairs of conduit knockouts in the top of the housing can be utilized for the attachment of two rigid conduit stems. One pair of $\frac{3}{8}$ -inch I.P. size knockouts is spaced on 19 $\frac{1}{2}$ -inch centers. Another pair of $\frac{1}{2}$ -inch I.P. size knockouts is spaced on 36-inch centers. The third pair of knockouts are $\frac{3}{4}$ -inch I.P. size and are spaced on 33-inch centers. Any one of the knockouts in the top of the housing can also be utilized for installation of a Levolver Fixture Switch, listed on page 294, under Accessories.

Canopy Suspension—For a more decorative means of suspension, Catalog No. 42040 Twin-Stem Canopy Suspension, with stems of $\frac{5}{8}$ -inch O.D. welded steel tubing, spaced on 19 $\frac{1}{2}$ -inch centers, is recommended.

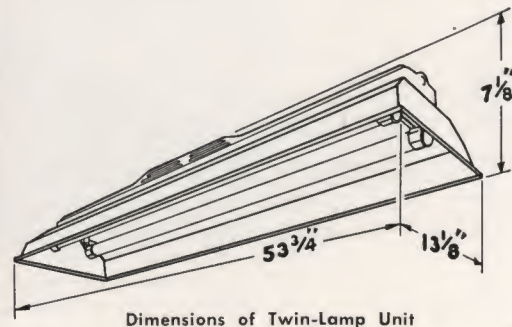
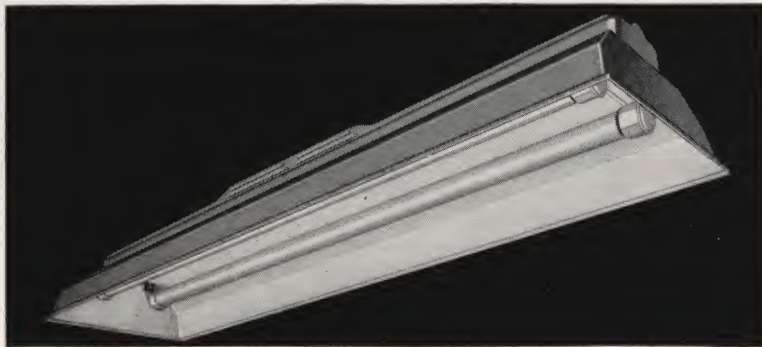
Assured Performance

Auxiliary control equipment is certified by Electrical Testing Laboratories and by the manufacturer. Ballasts, lamp holders and starters are listed separately by Underwriters' Laboratories, and complete units carry Underwriters' Inspection Label. "Stream-Flo 40" units meet RLM specifications and bear the RLM label which is an assurance of uniform quality and light output.

Guarantee—Benjamin lighting units when properly installed and under normal conditions of use, are guaranteed against mechanical and electrical defects for a period of one year from date of delivery to the purchaser, with the exception of the lamp starters for which the guarantee is limited to a period of 90 days. Correction of such defects by repair or replacement of material only shall constitute fulfillment of all obligations under this guarantee by the Benjamin Company.

Twin-Lamp RLM "STREAM-FLO 40" Units

Porcelain Enameled Closed-end Units
for Two 40-Watt (48-inch) Fluorescent Lamps



Dimensions of Twin-Lamp Unit

Twin-Lamp Units—Wired with 6-inch Leads

WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS★

Line Voltage†	Control Equipment	Net Weight Lbs. Each	Cat. No.	List Price	Consisting Parts	
					Housing No.	Reflec. No.
110-125 Volts, 60 Cycles*	1 Twin Lamp Ballast—95% Power Factor	28	40662-W	\$30.80	N-662-W	8462
220-250 Volts, 60 Cycles*	1 Twin Lamp Ballast—95% Power Factor	28	40682-W	30.80	N-682-W	8462

WITH CONVENTIONAL BALLASTS AND STANDARD (FS-4) STARTERS

110-125 Volts, 60 Cycles*	1 Twin Lamp Ballast—95% Power Factor	28	40662	29.40	N-662	8462
220-250 Volts, 60 Cycles*	1 Twin Lamp Ballast—95% Power Factor	28	40682	29.40	N-682	8462

WITH INSTANT STARTING BALLASTS—NO LAMP STARTERS NEEDED

110-125 Volts, 60 Cycles	1 Twin Lamp Ballast—95% Power Factor	31	40762	35.60	N-762	8462
--------------------------	--------------------------------------	----	-------	-------	-------	------

Twin-Lamp Units—Wired with 6-foot Cord and Plug Cap

WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS★

Line Voltage†	Control Equipment	Net Weight Lbs. Each	Two-Wire		Three-Wire	
			Cat. No.†	List Price	Cat. No.†	List Price
110-125 Volts, 60 Cycles*	1 Twin Lamp Ballast—95% Power Factor	28½	40662-CW	\$32.50	40662-PW	\$33.00
220-250 Volts, 60 Cycles*	1 Twin Lamp Ballast—95% Power Factor	28½	.....	.....	40682-PW	33.00

WITH CONVENTIONAL BALLASTS AND STANDARD (FS-4) STARTERS

110-125 Volts, 60 Cycles*	1 Twin Lamp Ballast—95% Power Factor	28½	40662-C	31.10	40662-P	31.60
220-250 Volts, 60 Cycles*	1 Twin Lamp Ballast—95% Power Factor	28½	.....	.....	40682-P	31.60

WITH INSTANT STARTING BALLASTS—NO LAMP STARTERS NEEDED

110-125 Volts, 60 Cycles	1 Twin Lamp Ballast—95% Power Factor	31½	40762-C	37.30	40762-P	37.80
--------------------------	--------------------------------------	-----	---------	-------	---------	-------

★ Consisting Parts: Reflector, No. 8462; Housing, same as for Units with 6-inch leads except suffix "C" (for 2-wire) or "P" (for 3-wire) to the appropriate Housing Number.

Accessories

Description	Suffix used to Specify Accessories on Complete Unit	Cat.† No.	List Price
Levolier Fixt. Switch, No. 41, Single Pole 6 amp., 125V.; 3 amp., 250V.	LA	5261	\$1.60
Levolier Fixt. Switch, No. 276, Double Pole 6 amp., 125V.; 3 amp., 250V.	LB	5262	2.00
1 Pr. 5 ft. Hvy. Duty Chain Assemblies, Complete with Hooks	..	5243	1.10
Longitudinal Shield	..	8446	2.60
Twin Stem Canopy Suspension (19½" centers)	..	42040	6.00

† Catalog Number to be used when ordering separately.

Lamps are not supplied.

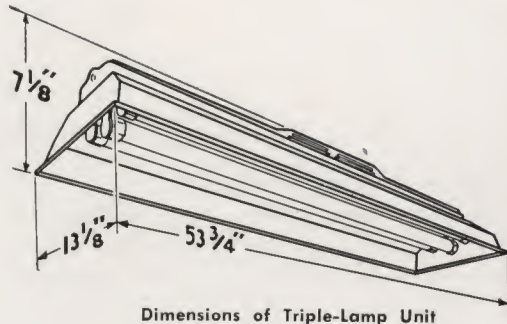
* 50 cycle ballast units supplied when specified at prices quoted upon application.

† Units supplied on special order with 199-216 or 240-280 volt conventional type ballasts at 220-250 volt conventional type ballast prices.

★ Automatic Reset, Nonblinking (FS-4NA) Starters can be supplied in place of FS-40 Starters at same unit list price. To order, suffix unit Cat. Nos. ending in "W" with "A."

Triple-Lamp RLM "STREAM-FLO 40" Units

Porcelain Enameled Closed-end Units for
Three 40-Watt (48-inch) Fluorescent Lamps



Dimensions of Triple-Lamp Unit



Triple-Lamp Units—Wired with 6-inch Leads

WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS ★

Line Voltage†	Control Equipment	Net Weight Lbs. Each	Cat. No.	List Price	Consisting Parts	
					Housing No.	Reflec. No.
110-125 Volts, 60 Cycles*	1 Triple Lamp Ballast—95% Power Factor	31½	40663-W	\$40.50	N-663-W	8462
220-250 Volts, 60 Cycles*	1 Triple Lamp Ballast—95% Power Factor	31½	40683-W	40.50	N-683-W	8462

WITH CONVENTIONAL BALLASTS AND STANDARD (FS-4) STARTERS

110-125 Volts, 60 Cycles*	1 Triple Lamp Ballast—95% Power Factor	31½	40663	38.40	N-663	8462
220-250 Volts, 60 Cycles*	1 Triple Lamp Ballast—95% Power Factor	31½	40683	38.40	N-683	8462

Triple-Lamp Units—Wired with 6-foot Cord and Plug Cap

WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS

Line Voltage†	Control Equipment	Net Weight Lbs. Each	Two-Wire		Three-Wire	
			Cat. No.†	List Price	Cat. No.†	List Price
110-125 Volts, 60 Cycles*	1 Triple Lamp Ballast—95% Power Factor	32	40663-CW	\$42.20	40663-PW	\$42.70
220-250 Volts, 60 Cycles*	1 Triple Lamp Ballast—95% Power Factor	32	.....		40683-PW	42.70

WITH CONVENTIONAL BALLASTS AND STANDARD (FS-4) STARTERS

110-125 Volts, 60 Cycles*	1 Triple Lamp Ballast—95% Power Factor	32	40663-C	40.10	40663-P	40.60
220-250 Volts, 60 Cycles*	1 Triple Lamp Ballast—95% Power Factor	32	.....	.....	40683-P	40.60

★ Consisting Parts: Reflector, No. 8462; Housing, same as for Units with 6-inch leads except suffix "C" (for 2-wire) or "P" (for 3-wire) to the appropriate Housing Number.

Accessories

* 50 cycle ballast units supplied when specified at prices quoted upon application.

† Units supplied on special order with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional type ballast prices.

★ Automatic Reset, Nonblinking (FS-4NA) Starters can be supplied in place of FS-40 Starters at same unit list price. To order, suffix unit Cat. Nos. ending in "W" with "A."

Description	Suffix used to Specify Accessories on Complete Unit	Cat. ‡ No.	List Price
Levolier Fixt. Switch, No. 41, Single Pole 6 amp., 125V.; 3 amp., 250V.	LA	5261	\$1.60
Levolier Fixt. Switch, No. 276, Double Pole 6 amp., 125V.; 3 amp., 250V	LB	5262	2.00
1 Pr. 5 ft. Hvy. Duty Chain Assemblies, Complete with Hooks	..	5243	1.10
Twin Stem Canopy Suspension (19½" centers)	..	42040	6.00

‡ Catalog Number to be used when ordering separately.

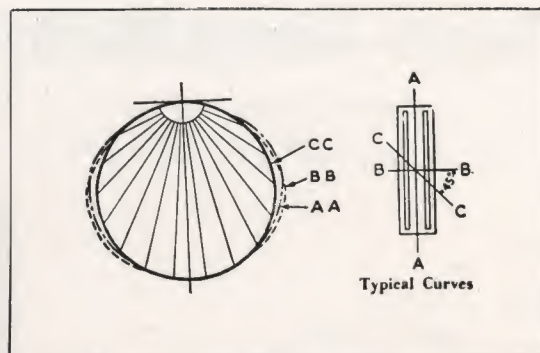
Lamps are not supplied.

Lighting Data

on Twin and Triple-Lamp "Stream-Flo 40" Units

Tables below are based on 40-watt (48-inch) 3500° "white" Mazda Fluorescent Lamps, 2300 lumens. (For 4500° "white" lamps, 2100 lumens, multiply values by .91; For 6500° "daylight" lamps, 1920 lumens, multiply values by .835). Mounting heights are distance above floor: footcandles values are on working plane 30 inches above floor.

Values are based on a minimum installation of 4 units and a maintenance factor of .75.



RLM "Stream-Flo 40" with 2 "White" Fluorescent Lamps of 2300 Lumens Each

Approximate Spacing	† Mounting height above floor	Area Per Unit	Room ‡ Conditions	ROOM PROPORTIONS** Average Footcandles on Horizontal		
				FAVORABLE	AVERAGE	UNFAVORABLE
7'x 7'	7'-6" to 9'-6"	49 Sq. Feet	very light fairly light fairly dark	49-53 48-49 46-48	45-48 39-45 35-39	32-36 26-32 24-26*
8'x 8'	8'-0" to 10'-6"	64 Sq. Feet	very light fairly light fairly dark	37-39 36-37 35-36	34-37 31-34 27-31	24-27 19.7-24 18.6-19.7*
9'x 9'	8'-6" to 11'-6"	81 Sq. Feet	very light fairly light fairly dark	30-32 28-30 27-28	26-30 24-26 21-24	19.0-22 15.3-19.0 14.5-15.3*
10'x10'	9'-6" to 12'-6"	100 Sq. Feet	very light fairly light fairly dark	24-25 23-24 22-23	22-24 19.3-22 17.2-19.3	15.3-17.6 12.7-15.3 11.7-12.7*
11'x11'	10'-0" to 13'-6"	121 Sq. Feet	very light fairly light fairly dark	19.9-21 19.4-19.9 18.5-19.4	18.0-19.6 16.0-18.0 14.2-16.0	12.7-14.6 10.5-12.7 10.1-10.5*
12'x12'	10'-6" to 14'-6"	144 Sq. Feet	very light fairly light fairly dark	16.8-17.7 16.2-16.8 15.6-16.2	15.1-16.5 13.4-15.1 11.9-13.4	10.9-12.6 9.6-10.9 8.4- 9.6*

RLM "Stream-Flo 40" with 3 "White" Fluorescent Lamps of 2300 Lumens Each

7'x 7'	7'-6" to 9'-6"	49 Sq. Feet	very light fairly light fairly dark	67-71 66-67 62-66	60-65 54-60 48-54	45-53 39-45 35-39*
8'x 8'	8'-0" to 10'-6"	64 Sq. Feet	very light fairly light fairly dark	51-55 50-51 48-50	47-49 42-47 37-42	35-39 30-35 26-30*
9'x 9'	8'-6" to 11'-6"	81 Sq. Feet	very light fairly light fairly dark	41-43 39-41 38-39	37-39 33-37 30-33	27-32 24-27 21-24*
10'x10'	9'-6" to 12'-6"	100 Sq. Feet	very light fairly light fairly dark	33-35 32-33 31-32	30-32 26-30 24-26	22-25 19.2-22 17.1-19.2*
11'x11'	10'-0" to 13'-6"	121 Sq. Feet	very light fairly light fairly dark	27-28 26-27 25-26	24-26 22-24 19.5-22	18.4-21 15.9-18.4 14.1-15.9*
12'x12'	10'-6" to 14'-6"	144 Sq. Feet	very light fairly light fairly dark	23-24 22-23 21-22	21-22 18.4-21 16.4-18.4	15.4-17.7 13.4-15.4 11.8-13.4*
13'6"x13'6"	11'-6" to 16'-0"	182 Sq. Feet	very light fairly light fairly dark	18.1-19.2 17.6-18.1 16.9-17.6	16.3-17.4 14.6-16.3 13.0-14.6	12.0-14.0 10.5-12.0 9.4-10.5*
15'x15'	12'-6" to 17'-6"	225 Sq. Feet	very light fairly light fairly dark	14.7-15.6 14.2-14.7 13.6-14.2	13.3-14.1 11.8-13.3 10.5-11.8	9.9-11.5 8.5- 9.9 7.6- 8.5*

* IMPRACTICAL—It is recommended that interior room conditions be improved or provision made for more frequent maintenance.

† Minimum heights shown are for spacing ratio of 1½ to 1. The greater heights are for 1 to 1 spacing.

‡ ROOM CONDITIONS—To determine condition of walls and ceilings consult chart in Section 1, General Catalog.

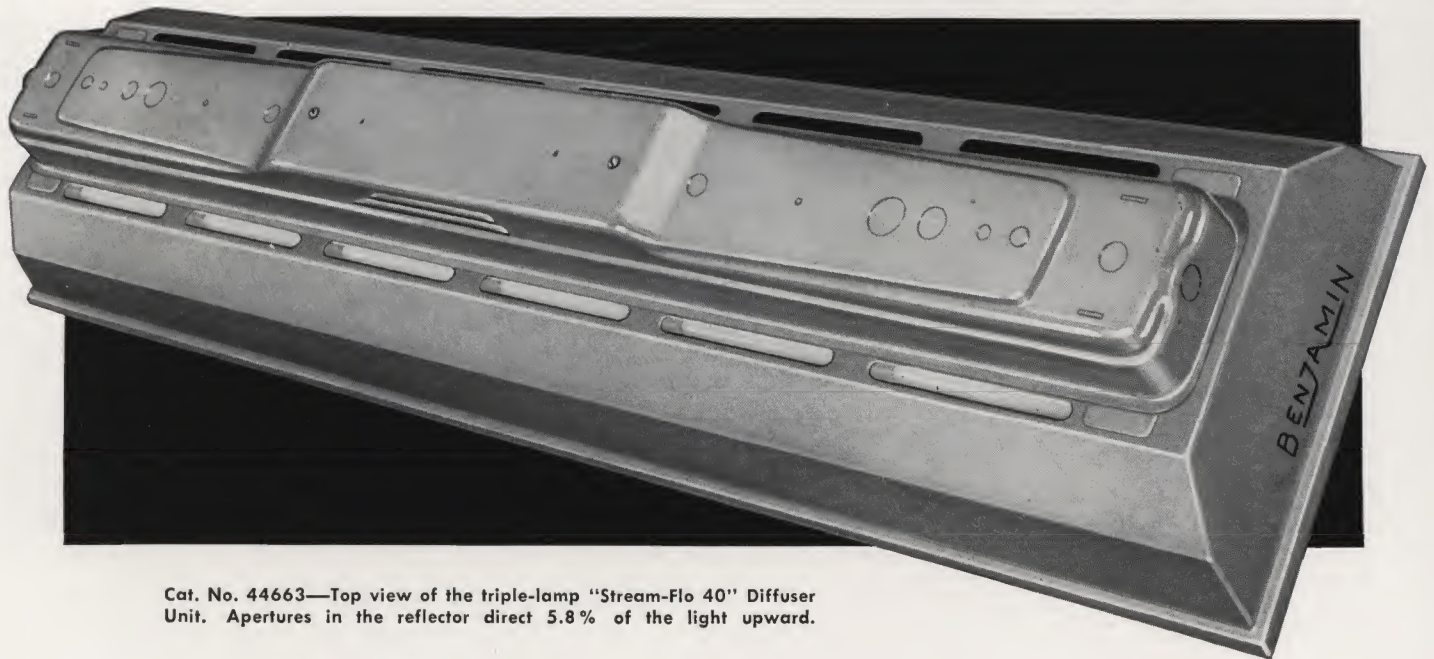
** ROOM PROPORTIONS—Use "Favorable" for broad rooms where width is about four times mounting height above floor.

Use "Average" where room width is about twice the mounting height above floor.

Use "Unfavorable" for narrow rooms where width is about equal to mounting height above floor.

Benjamin "Stream-Flo 40" Diffuser Units

A Porcelain Enameled Unit with Apertures Directing Part of the Light Upward



Cat. No. 44663—Top view of the triple-lamp "Stream-Flo 40" Diffuser Unit. Apertures in the reflector direct 5.8% of the light upward.

These Benjamin Closed-End Lighting Units have all of the excellent lighting characteristics of the conventional "Stream-Flo 40" units for general and local illumination plus the addition of apertures which cut down high brightness contrasts and thus provide better "seeing" conditions in the general illumination of industrial and commercial locations.

These twelve apertures (arranged in two rows of six each) in the top of the reflector direct upward 6.7% of the total light output of the twin-lamp unit and 5.8% of the triple-lamp unit to soften contrast, increase eye comfort, and make the room more cheerful.

Among the other features of these units is the exclusive, Benjamin "Springlox" lampholder which provides fast, easy relamping and locks lamps safely in place. Another feature is the hand-operated "Lok-Latch" reflector fasteners. With lamps removed, one quarter turn of the two "Lok-Latch" thumb nuts releases the reflector for removal and exposes the control equipment in the housing.

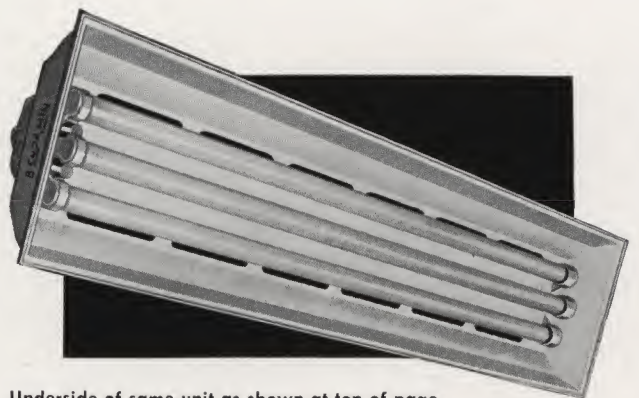
SPECIFICATIONS

Streamlined Housing—Ballast and exclusive Benjamin safety type lampholders are mounted in the one-piece streamlined housing which is drawn from 20 gauge steel. Inner and outer surfaces are finished in baked, gray enamel.

Porcelain Enamel Reflectors—Reflectors are made of 20 gauge steel, completely covered with Benjamin "lifetime" porcelain enamel—outer surfaces are finished in gray, inner surfaces in reflecting white. Twelve elongated apertures in two rows of six each pierce the top of the reflector.

Efficiency—The design of the reflector, proper positioning of the lamps, high reflection factor of the porcelain enamel (exceeding 82%), location and size of apertures and other factors combine to give an efficiency of 77% or more of the combined output of the lamps in the 0° to 90° zone and a minimum of 5.6% in the 90° to 180° zone from the twin-lamp unit. For the triple lamp unit, the efficiency is 74% in the 0° to 90° zone and a minimum of 4.6% in the 90° to 180° zone.

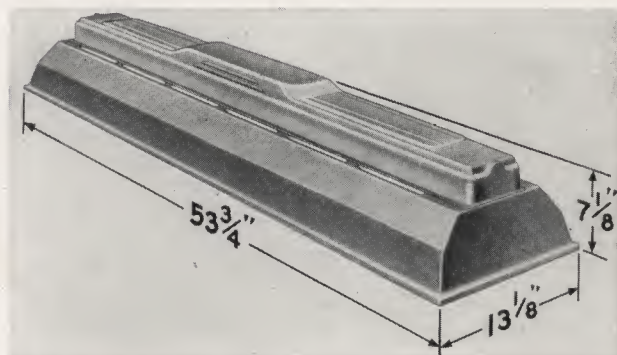
Additional Information—For additional specifications and data, please refer to the "Stream-Flo 40" units to be found on pages 291 and 293.



Underside of same unit as shown at top of page.

Benjamin "Stream-Flo 40" Diffuser Units

Twin and Triple-Lamp 40-Watt Porcelain Enameled Units With Apertures



METHODS OF SUSPENSION

Chain Mounting—Single or double chain supports can be attached to each end of the housing by means of two detachable angle mounting brackets (spaced on 46 3/4-inch centers) supplied with the unit. For listing of such a suspension, see Accessories below.

Conduit Mounting—Conduit knockouts for the insertion of rigid conduit stems are spaced as follows: One pair of 3/8-inch knockouts on 19 1/2-inch centers; one pair of 1/2-inch knockouts on 36-inch centers; one pair of 3/4-inch knockouts on 33-inch centers.

Canopy Suspension—For a more decorative means of suspension Catalog No. 42040 Twin-Stem Canopy Suspension, With 3/8-inch stems spaced on 19 1/2-inch centers, is recommended.

TWIN-LAMP UNITS—WIRED WITH 6-INCH LEADS

With Conventional Ballasts and Standard (FS-4) Starters

Line Voltage†	Control Equipment	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
					Hous. No.	Ref. No.
110-125 Volts, 60 Cycles*	1 Twin-Lamp Ballast—95% Power Factor	27 1/2	44662	\$29.90	N-662	8466
220-250 Volts, 60 Cycles*	1 Twin-Lamp Ballast—95% Power Factor	27 1/2	44682	29.90	N-682	8466

With Conventional Ballasts and Manual Reset, Nonblinking (FS-40) Starters★

110-125 Volts, 60 Cycles*	1 Twin-Lamp Ballast—95% Power Factor	27 1/2	44662-W	\$31.30	N-662-W	8466
220-250 Volts, 60 Cycles*	1 Twin-Lamp Ballast—95% Power Factor	27 1/2	44682-W	31.30	N-682-W	8466

With Instant Starting Ballasts—No Lamp Starters Needed

110-125 Volts, 60 Cycles*	1 Twin-Lamp Ballast—95% Power Factor	30 1/2	44762	\$36.10	N-762	8466
---------------------------	--------------------------------------	--------	-------	---------	-------	------

TRIPLE-LAMP UNITS—WIRED WITH 6-INCH LEADS

With Conventional Ballasts and Standard (FS-4) Starters

Line Voltage†	Control Equipment	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
					Hous. No.	Ref. No.
110-125 Volts, 60 Cycles*	1 Triple-Lamp Ballast—95% Power Factor	31	44663	\$38.90	N-663	8466
220-250 Volts, 60 Cycles*	1 Triple-Lamp Ballast—95% Power Factor	31	44683	38.90	N-683	8466

With Conventional Ballasts and Manual Reset, Nonblinking (FS-40) Starters★

110-125 Volts, 60 Cycles*	1 Triple-Lamp Ballast—95% Power Factor	31	44663-W	\$41.00	N-663-W	8466
220-250 Volts, 60 Cycles*	1 Triple-Lamp Ballast—95% Power Factor	31	44683-W	41.00	N-683-W	8466

Units with 6-foot Cord and Plug—To order, suffix unit Cat. Nos. with "C" for 2-wire cord (for 110-125 V. units only) and plug and add \$1.70 to unit list price; for 3-wire cord and plug, suffix unit Cat. Nos. with "P"

and add \$2.20. On unit Cat. Nos. ending in "W", insert "C" or "P" before the "W".

ACCESSORIES

Description	Suffix used to Specify Accessories on Complete Unit	Cat.† No.	List Price
Levolier Fixt. Switch, No. 41, Single Pole 6 amp., 125V.; 3 amp., 250V.	LA	5261	\$1.60
Levolier Fixt. Switch, No. 276, Double Pole 6 amp., 125V.; 3 amp., 250V.	LB	5262	2.00
1 Pr. 5 ft. Hvy. Duty Chain Assemblies, Complete with Hooks	.....	5243	1.10
Twin Stem Canopy Suspension (19 1/2" Centers and 24" Stems)	.....	42040	6.00
Longitudinal Shield (For Twin-Lamp Units Only)	.....	8446	2.60

† Catalog Number to be used when ordering separately.

Lamps are not supplied.

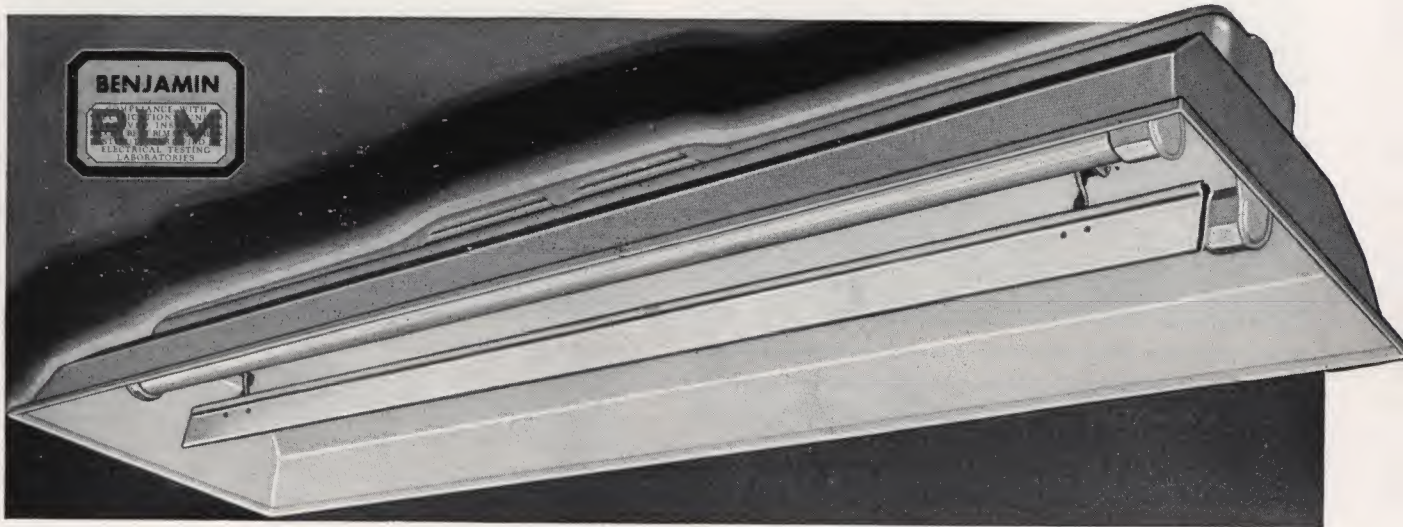
* 50 cycle ballast units supplied at prices quoted upon application.

† Units supplied on special order with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional type ballast prices.

★ Automatic Reset, Nonblinking (FS-4NA) Starters can be supplied in place of FS-40 Starters at same unit list price. To order, suffix unit Cat. Nos. ending in "W" with "A".

Benjamin RLM "SHIELD-FLO 40" Units

"Series 40" Porcelain Enameled Closed-end Units with Shield
for Two 40-watt Fluorescent Lamps

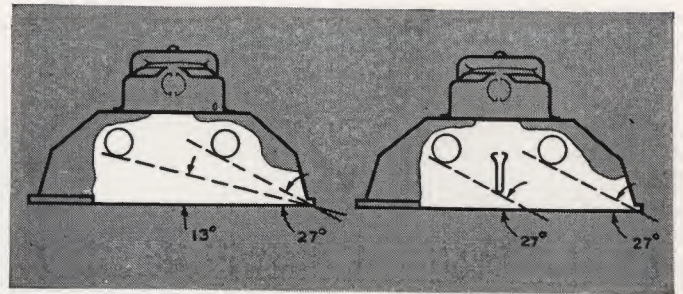


This line of highly efficient fluorescent lighting units is designed for use in installations where a greater degree of lamp shielding is desired than is provided by regular Benjamin "Stream-Flo 40" units.

The "Shield-Flo 40" unit consists of the latest style standard twin-lamp "Stream-Flo 40" fluorescent unit, (as listed on page 294) plus a white matte finish porcelain enameled longitudinal shield. This shield provides the same 27 degree of crosswise shielding for the far lamp as is provided by the cut-off of the reflector for the near lamp. By shielding both lamps from view at normal angles of vision, direct glare is materially reduced, with a consequent increase in eye comfort.

High Efficiency — With "Shield-Flo 40" units, lamp shielding is achieved with a minimum sacrifice of light output. The loss in "effective illumination" (that is light from the unit that reaches the average visual task) is only 3%, as most of the longitudinal shield influence is in the higher angles of candlepower distribution.

Low Brightness — The "Shield-Flo 40" unit is of great value in planning controlled brightness lighting installations. Accepted brightness values can be easily obtained without eye strain, as the relatively bright lamp surfaces are shielded



The above illustration gives the comparative shielding angle of a "Stream-Flo 40" closed-end fluorescent lighting unit without a shield and the Benjamin "Shield-Flo 40" fluorescent unit. Note that the "Shield-Flo 40" unit (illustrated at right) gives a crosswise shielding angle of 27 degrees as compared to a 13 degree shielding angle afforded by the "Stream-Flo 40" unit (illustrated at left).

from the worker's view. The 27 degree crosswise shielding of the far lamp by the longitudinal shield, limits the maximum visible brightness at the shielding angle to 1.5 candles per square inch (when integrated over a one square inch area.) This affords a reduction in shielding angle brightness of approximately 60% over similar units without the shield.

The "Shield-Flo 40" unit is particularly desirable for use in supplying localized illumination as it lends added protection against glare to adjacent workers.

(Issued September 19, 1949)

BENJAMIN • page 301

(From General Catalog)

Lighting Applications

for RLM "SHIELD-FLO 40" Unit

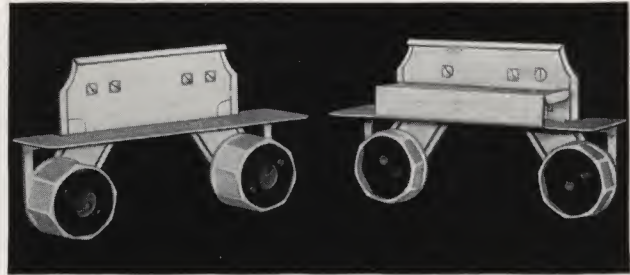
Lighting Applications

In general lighting installations, "Shield-Flo 40" fluorescent lighting units utilizing two 40-watt (48-inch) fluorescent lamps provide lighting levels from 21 to 47 footcandles at normal mounting and spacing. In localized lighting installations, "Shield-Flo 40" fluorescent units with two 40-watt fluorescent lamps provide up to 100 footcandles when mounted 30 to 36 inches above the working plane. All of the above values are based on the use of 3500 degree "white" lamps.

Light Output — The design of the reflector and shield, high reflection factor of the porcelain enamel, proper positioning of the lamps and other factors combine to give an efficiency of 70% or more of the output of the two 40-watt fluorescent lamps.

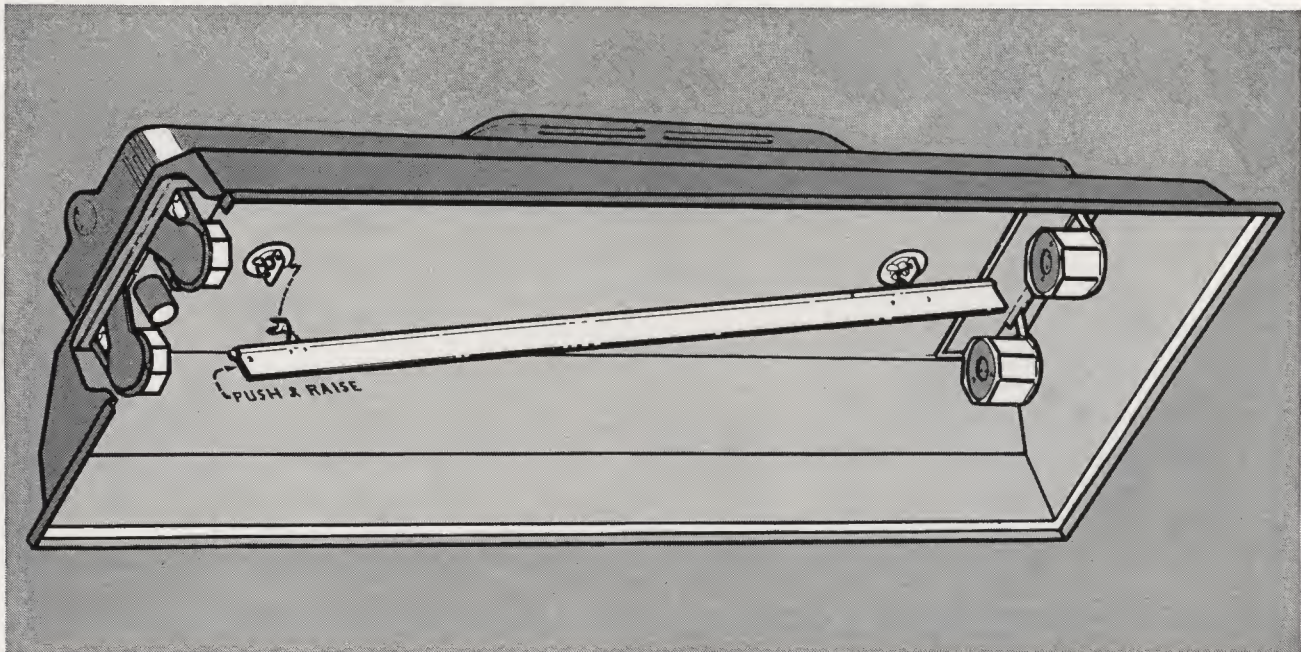
Shielding Angle — When a line is drawn perpendicular to the porcelain enameled longitudinal shield centered between the two lamps, and tangent to the lower edge of either lamp, this line forms a crosswise shielding angle of 27°.

"SPRINGLOX" Lampholders — An outstanding feature of "Shield-Flo 40" units is the Benjamin metal-clad, safety



New exclusive Benjamin one-piece, metal-clad safety type lamp-holder assemblies regularly supplied with "Shield-Flo 40" Units.

type "SPRINGLOX" lampholder assemblies which simplify the insertion and removal of lamps, and eliminate any possibility of lamps dropping out accidentally. In installing, simply slip one end of the lamp into the lampholder with a flexible spring base—this allows sufficient clearance for the lamp pins on the opposite end of the lamp to be slipped into the facing lampholder having a solid base. The pressure of the life-time spring securely locks the lamp in place. Lampholder assemblies space lamps on 5-inch centers.

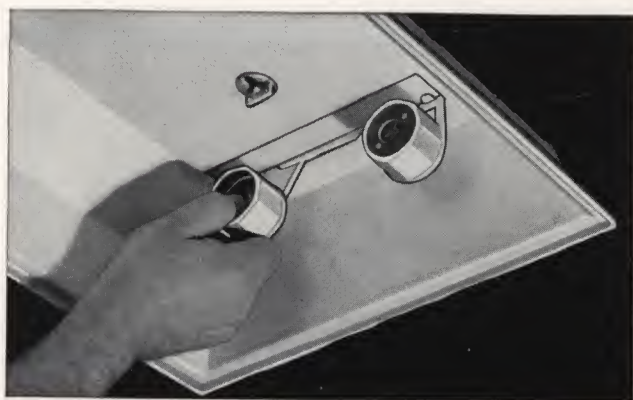


The longitudinal shield is easily removed or firmly positioned between the two lamps by means of two suspension arms. To place shield in position, the two small fingers of the movable suspension arm are placed into the holes provided in the far

"LOK-LATCH" reflector fastener. The shield is then pushed forward compressing the spring, permitting the stationary suspension arm on the opposite end of the shield to be placed in position and held securely by the opposite "LOK-LATCH" fastener.

Specifications

for RLM "SHIELD-FLO 40" Unit



Illustrating the spring action of the Benjamin "SPRINGLOX" lamp-holders. Lamp installation is the work of a moment. Simply slip one end of the lamp into the lampholder equipped with a flexible spring base (illustrated above)—this allows sufficient clearance for the contact pins on the opposite end of the lamp to be slipped into the facing solid base type lampholder.

Separable Construction — "Shield-Flo 40" fluorescent lighting units are constructed so that they can be dismantled without the use of tools.

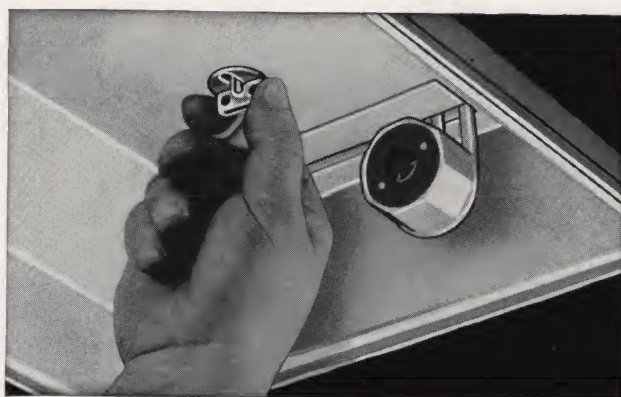
The closed-end heavy duty porcelain enameled reflectors are easily removed or attached to the rugged steel housings in a few simple movements.

Ballast and exclusive Benjamin "SPRINGLOX" safety type lampholder assemblies are attached to the steel housing, so that by simply removing the longitudinal shield and lamps, the reflector may be easily detached for cleaning. In installing the unit, the housing can be put up first and wiring connections completed. Attachment of the reflector to the installed housing is then easily completed by a quarter turn of the "LOK-LATCH" fasteners.

The porcelain enameled longitudinal shield is easily removed or firmly positioned between the two lamps by means of two suspension arms. To place the shield in position, the two small fingers of the movable suspension arm are first placed into the holes provided in the "LOK-LATCH" reflector fastener. The shield is then pushed forward compressing the spring, permitting the stationary suspension arm on the opposite end of the shield to be placed in its proper position and held securely by the opposite "LOK-LATCH" reflector fastener.

Streamlined Housings — Ballast and exclusive Benjamin metal-clad "SPRINGLOX" safety type lampholder assemblies are mounted in the one-piece streamlined housing which is drawn from 20 gauge steel. Inner and outer surfaces of the housing are finished in gray enamel.

(Issued September 19, 1949)



The heavy duty porcelain enameled closed-end reflector is easily attached or removed from the drawn steel housing by a quarter turn of two hand operated "LOK-LATCH" reflector fasteners. An aluminum grommet protects reflector finish. The two holes provided in each of the "LOK-LATCH" fasteners are utilized for positioning the porcelain enameled longitudinal shield.

Porcelain Enamel Reflectors — Reflectors are made of porcelain enameling iron, completely covered with Benjamin "lifetime" porcelain enamel — outer surfaces are finished in gray, inner surfaces are reflecting white. The reflection factor is 82 percent or more.

Longitudinal Shield — The longitudinal shield is also made of porcelain enameling iron, completely covered with Benjamin "lifetime" white porcelain enamel having a matte finish with a reflection factor of 78 percent.

Ballast and Starters — "Shield-Flo 40" fluorescent units are listed with conventional type, high power factor ballasts, or with instant starting ballasts. On units with conventional type ballasts, a removable non-blinking (FS-40) or a regular type (FS-4) starter is supplied for each lamp.

Power Consumption — "Shield-Flo 40" units with lamps and conventional type ballasts use approximately 100 watts. Twin-lamp units with instant starting type ballasts and lamps use approximately 110 watts.

Flicker — All ballasts operate the lamps out of phase to minimize cyclic flicker.

Wiring — Units are furnished wired and come either with 6-inch leads or a 6-foot length two or three-wire cord and plug set. Two-wire cord sets have a standard two blade plug cap and are approved for use on 110-125 volt service only. Three-wire cord sets have a two blade plug cap with a wire coming out the side for grounding. Cord sets are wired to the unit.

Provision for Grounding — Metal-to-metal bond is provided between electrical units and housing for grounding.

BENJAMIN • page 303

(From General Catalog)

Methods of Suspension

for RLM "SHIELD-FLO 40" Unit

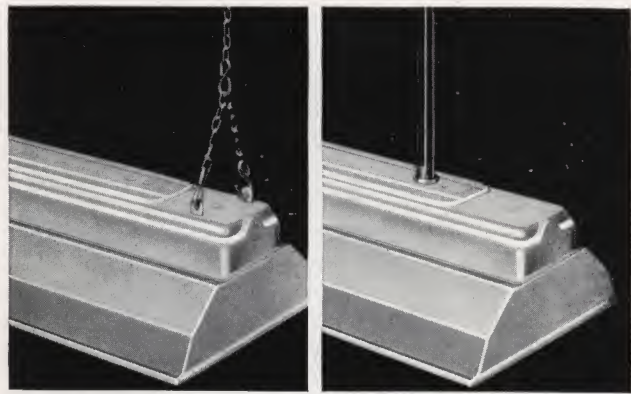
Chain Mounting—Single or double chain supports can be attached to each end of the housing by means of two detachable mounting brackets, (spaced on 46 $\frac{3}{4}$ -inch centers) supplied with the unit. Only welded or lock-link chain should be used for suspensions. For listing of such a suspension, see page 305, under Accessories. In wiring, lead-in wires can be brought into the top of the housing, using one of the six conduit knockouts provided.

Conduit Mounting—Any one of three pairs of conduit knockouts in the top of the housing can be utilized for attachment of two rigid conduit stems. One pair of $\frac{3}{8}$ -inch I.P. size knockouts is spaced on 19 $\frac{1}{2}$ -inch centers. Another pair of $\frac{1}{2}$ -inch I.P. size knockouts is spaced on 36-inch centers. The third pair of $\frac{3}{4}$ -inch I.P. size knockouts is spaced on 33-inch centers. Any one of the knockouts in the top of the housing can also be utilized for installation of a Levolver Fixture Switch, listed on page 305, under Accessories.

Canopy Suspension—For a more decorative means of suspension, Catalog No. 42040 Twin-Stem Canopy Suspension, with stems of $\frac{5}{8}$ -inch outside diameter welded steel tubing, spaced on 19 $\frac{1}{2}$ -inch centers, is recommended; see page 305.

Assured Performance

Auxiliary control equipment is certified by Electrical Testing Laboratories and by the manufacturer. Ballasts, lampholders and starters, are listed separately by Underwriters' Laboratories, and complete units carry Underwriters' Inspection Label. "Shield-Flo 40" units meet RLM specifications and bear the RLM label which is an assurance of uniform quality and light output.

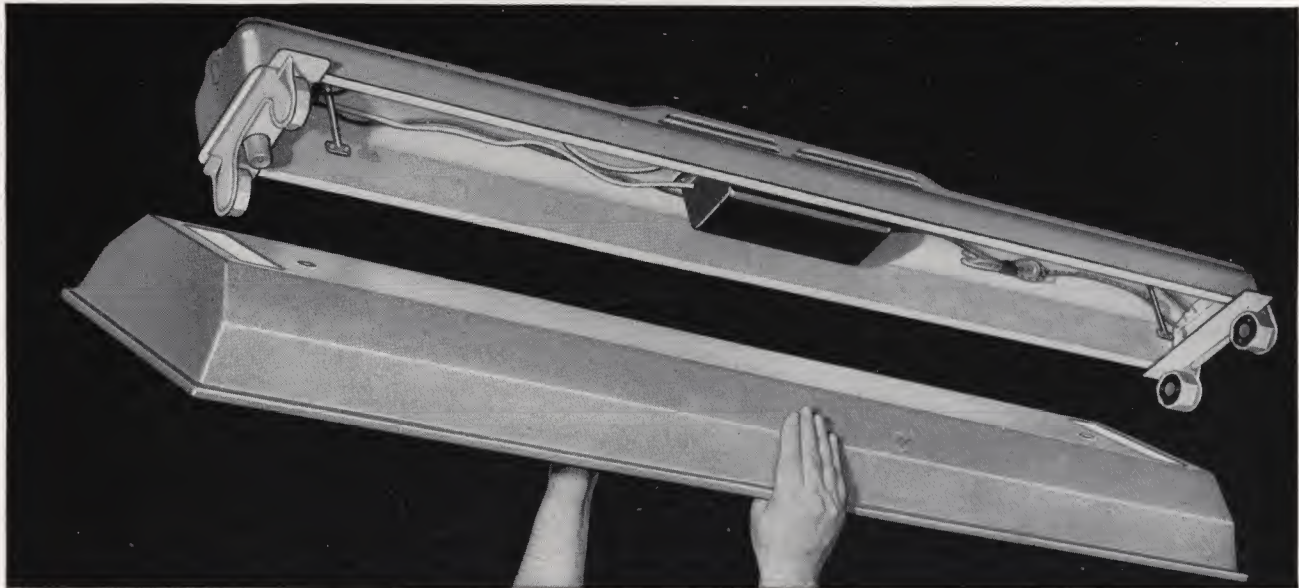


Chain Mounting—A chain support (as shown) can be attached to each end of the housing by means of two detachable mounting brackets supplied with unit.

Conduit Mounting—Any one of three pairs of conduit knockouts in the top of the housing can be utilized for attachment of rigid conduit stems.

Benjamin Guarantee

Benjamin lighting units when properly installed and under normal conditions of use, are guaranteed against mechanical and electrical defects for a period of one year from date of delivery to the purchaser, with the exception of the lamp starters for which the guarantee is limited to a period of 90 days. Correction of such defects by repair or replacement of material only shall constitute fulfillment of all obligations under this guarantee by the Benjamin Company.

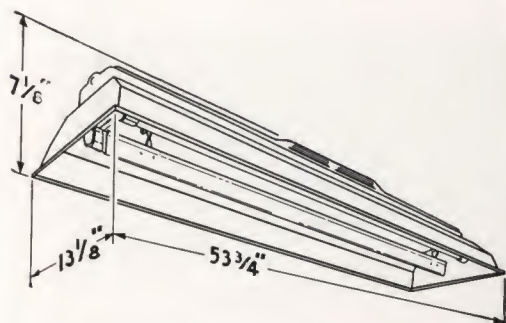


Ballast and exclusive Benjamin metal-clad "SPRINGLOX" safety type lampholder assemblies are supported by the steel housing

so that by simply removing the longitudinal shield and lamps the porcelain enameled reflector may be easily detached for cleaning.

Benjamin RLM "SHIELD-FLO 40" Units

Porcelain Enameled Closed-end Units with Shield — for
Two 40-watt (48-inch) Fluorescent Lamps



Dimensions of "SHIELD-FLO 40" Unit



Wired with 6-inch Leads

WITH CONVENTIONAL BALLASTS AND NON-BLINKING MANUAL RESET (FS-40) STARTERS ★

Line Voltage (60 Cycles*)	Ballast Equipment (95% Power Factor)	Net Weight Lbs. Each	Cat. No.	List Price	Consisting Parts		
					Housing No.	Reflector No.	Shield No.
110-125 Volts	1 Twin Lamp	31	41662-W	\$33.40	N-662-W	8462	8446
220-250 Volts†	1 Twin Lamp	31	41682-W	33.40	N-682-W	8462	8446

WITH CONVENTIONAL BALLASTS AND REGULAR (FS-4) STARTERS

110-125 Volts	1 Twin Lamp	31	41662	32.00	N-662	8462	8446
220-250 Volts†	1 Twin Lamp	31	41682	32.00	N-682	8462	8446

WITH INSTANT STARTING BALLASTS—NO STARTERS NEEDED

110-125 Volts	1 Twin Lamp	34	41762	38.20	N-762	8462	8446
---------------	-------------	----	-------	-------	-------	------	------

Wired with 6-foot Cord and Plug Cap

WITH CONVENTIONAL BALLASTS AND NON-BLINKING MANUAL RESET (FS-40) STARTERS ★

Line Voltage (60 Cycles*)	Ballast Equipment (95% Power Factor)	Net Weight Lbs. Each	Two-Wire			Three-Wire		
			Cat. No.	List Price	Consist. Parts ♦	Cat. No.	List Price	Consist. Parts ♦
					Housing No.			Housing No.
110-125 Volts	1 Twin Lamp	31½	41662-CW	\$35.10	N-662-CW	41662-PW	\$35.60	N-662-PW
220-250 Volts†	1 Twin Lamp	31½	.....	.....	.....	41682-PW	35.60	N-682-PW

WITH CONVENTIONAL BALLASTS AND REGULAR (FS-4) STARTERS

110-125 Volts	1 Twin Lamp	31½	41662-C	33.70	N-662-C	41662-P	34.20	N-662-P
220-250 Volts†	1 Twin Lamp	31½	.....	.....	.....	41682-P	34.20	N-682-P

WITH INSTANT STARTING BALLASTS—NO STARTERS NEEDED

110-125 Volts	1 Twin Lamp	34½	41762-C	39.90	N-762-C	41762-P	40.40	N-762-P
---------------	-------------	-----	---------	-------	---------	---------	-------	---------

♦ Complete units consist of housing number shown, reflector No. 8462 and shield No. 8446.

Accessories

Description	Suffix used to Specify Accessories on Complete Unit	Cat. No.	List Price
Levolier Fixt. Switch, No. 41, Single Pole 6 amp., 125V.; 3 amp., 250V.	LA	‡5261	\$1.60
Levolier Fixt. Switch, No. 276, Double Pole 6 amp., 125V.; 3 amp., 250V.	LB	‡5262	2.00
1 Pr. 5 ft. Hvy. Duty Chain Assemblies, Complete with Hooks	..	5243	1.10
Twin Stem Canopy Suspension (19½" centers)	..	42040	6.00

‡ Catalog Number to be used when ordering switch separately.

Lamps are not supplied.

* 50 cycle ballast units supplied when specified at prices quoted upon application.

† Units supplied on special order with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional type ballast prices.

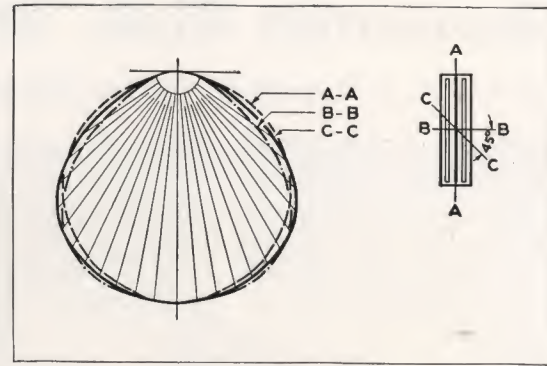
★ Automatic Reset, Nonblinking (FS-4NA) Starters can be supplied in place of FS-40 Starters at same unit list price. To order, suffix unit Cat. Nos. ending in "W" with "A."

Lighting Data

on "SHIELD-FLO 40" Units

Tables below are based on 40 watt (48 inch) 3500° "white" Mazda Fluorescent Lamps, 2300 lumens. (For 4500° "white" lamps, 2100 lumens, multiply values by .91; for 6500° "daylight" lamps, 1920 lumens, multiply values by .835). Mounting heights are distance above floor: footcandle values are on working plane 30 inches above floor.

Values are based on a minimum installation of 4 units and a maintenance factor of .75.



RLM "SHIELD-FLO 40" Units with 2 "White" Fluorescent Lamps of 2300 Lumens Each

REFLECTION FACTOR OF SHIELD — 78%

Approximate Spacing	†Mounting height above floor	Area Per Unit	Room‡ Conditions	ROOM PROPORTIONS**		
				Average Footcandles on Horizontal		
7'x7'	7'-6" to 9'-6"	49 Sq. Feet	very light fairly light fairly dark	45-47	39-44	29-35
				43-46	36-42	27-32
				42-45	33-39	25-29*
8'x8'	8'-0" to 10'-6"	64 Sq. Feet	very light fairly light fairly dark	33-35	30-33	22-27
				32-34	27-32	20-24
				32-33	25-30	19-22*
9'x9'	8'-6" to 11'-6"	81 Sq. Feet	very light fairly light fairly dark	26-28	23-26	18-21
				25-27	21-24	16-20
				25-26	20-23	15-18*
10'x10'	9'-6" to 12'-6"	100 Sq. Feet	very light fairly light fairly dark	21-22	19-21	14.6-17
				20-22	17-20	13.4-16
				20-21	16-19	12.4-14.6*
11'x11'	10'-0" to 13'-6"	121 Sq. Feet	very light fairly light fairly dark	18-19	16-18	12.1-14.3
				17-19	14.6-17	11.1-13.4
				17-18	13.4-16	10.3-12.1*
12'x12'	10'-6" to 14'-6"	144 Sq. Feet	very light fairly light fairly dark	15-16	13.2-14.9	10.2-12.0
				14.5-16	12.2-14.2	9.3-11.2
				14.2-15	11.3-13.2	8.6-10.2*

* IMPRACTICAL — It is recommended that interior room conditions be improved or provision made for more frequent maintenance.

† Minimum heights shown are for spacing ratio of 1½ to 1. The greater heights are for 1 to 1 spacing.

‡ ROOM CONDITIONS — To determine condition of walls and ceilings consult chart in Section 1, General Catalog.

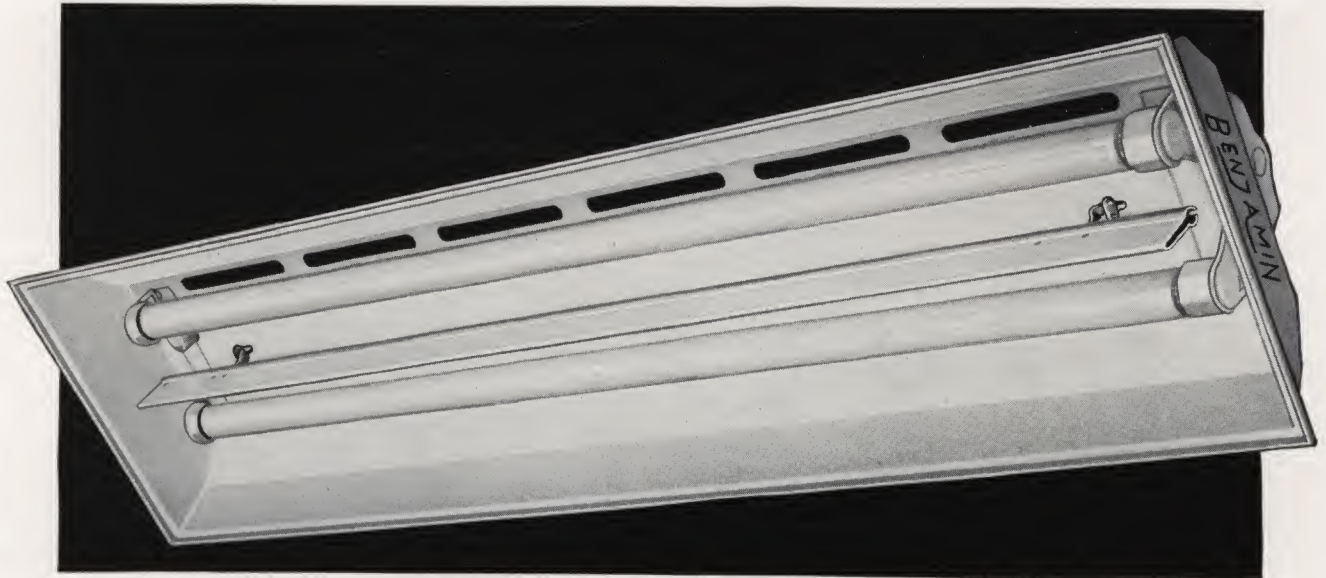
** ROOM PROPORTIONS — Use "Favorable" for broad rooms where width is about four times mounting height above floor.

Use "Average" where room width is about twice the mounting height above floor.

Use "Unfavorable" for narrow rooms where width is about equal to mounting height above floor.

Benjamin "Shield-Flo 40" Diffuser Units

Closed-End Porcelain Enameled Units with Apertures Directing Part of the Light Upward and a 27-degree Shielding Angle for Better Brightness Control



Cat. No. 45662—Top view of the "Shield-Flo 40" Diffuser Unit. The apertures direct 7.7% of the light upward and the porcelain enameled shield increases the shielding angle to 27 degrees.

These new Benjamin Closed-End Lighting Units with a longitudinal shield have all of the excellent lighting characteristics of the conventional "Shield-Flo 40" units for general and local illumination plus the addition of apertures which cut down high brightness contrasts and thus provide better "seeing" conditions in the general illumination of industrial and commercial locations.

"Shield-Flo 40" Diffuser Units are of great value in planning controlled brightness lighting installations.

The twelve apertures (arranged in two rows of six each) in the top of the reflector direct 7.7% of the light output of the unit upward to soften contrast, increase eye comfort, and make the room more cheerful.

The 27 degree crosswise shielding of the far lamp by the longitudinal shield, limits the maximum visible brightness at the shielding angle to 1.5 candles per square inch. This reduces shielding angle brightness approximately 60% over similar units without the shield. Loss in "effective illumination," due to shielding, is only 3%, as most of the shield influence is in the higher angles of candlepower distribution.

Among the other features of these units is the exclusive, Benjamin "Springlox" lampholder which provides fast, easy relamping and locks lamps safely in place. Another feature is the hand-operated "Lok-Latch" reflector fasteners. With lamps removed, one quarter turn of the two "Lok-Latch" thumb nuts releases the reflector for removal and exposes the control equipment in the housing.

SPECIFICATIONS

Streamlined Housings—Ballast and exclusive Benjamin metal-clad "Springlox" safety type lampholder assemblies are mounted in the one-piece streamlined housing which is drawn from 20 gauge steel. Inner and outer surfaces of the housing are finished in gray enamel.

Porcelain Enamel Reflectors—Made of 20 gauge steel, completely covered with Benjamin "lifetime" porcelain enamel—outer surfaces are finished in gray, inner surfaces are reflecting white. Twelve elongated apertures in two rows of six each pierce the top of the reflector.

Longitudinal Shield—Formed of steel, completely covered with Benjamin "lifetime," white porcelain enamel having a matte finish with a reflection factor of 78%.

Efficiency—The design of the reflector, proper positioning of the lamps, high reflection factor of the porcelain enamel (exceeding 82%), location and size of apertures and other factors combine to give an efficiency of 69.1% or more of the combined output of the lamps in the 0° to 90° zone and a minimum of 5.8% in the 90° to 180° zone from the twin-lamp unit.

Additional Information—For additional specifications and data, please refer to the "Shield-Flo 40" units to be found on pages 301 and 304.

Benjamin "Shield-Flo 40" Diffuser Units

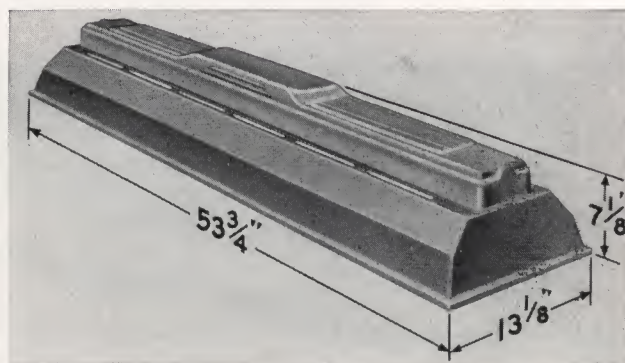
Twin-Lamp, Porcelain Enameled Units with 27-degree Shielding Angle and Apertures

METHODS OF SUSPENSION

Chain Mounting—Single or double chain supports can be attached to each end of the housing by means of two detachable angle mounting brackets (spaced on 46³/₄-inch centers) supplied with the unit. Only welded or lock-link chain should be used for suspensions. For listing of such a suspension, see Accessories below. Lead-in wires can be brought into the top of the housing, using one of the six conduit knockouts provided.

Conduit Mounting—Conduit knockouts for the insertion of rigid conduit stems are spaced as follows: One pair of ³/₈-inch knockouts on 19¹/₂-inch centers; one pair of ¹/₂-inch knockouts on 36-inch centers; one pair of ³/₄-inch knockouts on 33-inch centers. Any one of the knockouts in the top of the housing can also be utilized for installation of a Levolver Fixture Switch, listed under Accessories.

Canopy Suspension—For a more decorative means of



suspension Catalog No. 42040 Twin-Stem Canopy Suspension, with 24-inch length, ³/₈-inch stems spaced on 19¹/₂-inch centers, is recommended.

WIRED TWIN-LAMP UNITS WITH 6-INCH LEADS

With Conventional Ballasts and Standard (FS-4) Starters

Line Voltage† 60 Cycles*	Ballast Equipment (95% Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts		
					Housing No.	Reflector No.	Shield No.
110-125 Volts	1 Twin-Lamp	30 ¹ / ₂	45662	\$32.50	N-662	8466	8446
220-250 Volts	1 Twin-Lamp	30 ¹ / ₂	45682	32.50	N-682	8466	8446

With Conventional Ballasts and Manual Reset, Nonblinking (FS-40) Starters★

110-125 Volts	1 Twin-Lamp	30 ¹ / ₂	45662-W	33.90	N-662-W	8466	8446
220-250 Volts	1 Twin-Lamp	30 ¹ / ₂	45682-W	33.90	N-682-W	8466	8446

With Instant Starting Ballasts — No Lamp Starters Needed

110-125 Volts	1 Twin-Lamp	33 ¹ / ₂	45762	38.70	N-762	8466	8446
---------------	-------------	--------------------------------	-------	-------	-------	------	------

* 50 cycle ballast units supplied at prices quoted upon application.

† Units supplied on special order with 199-216 volt or 240-280 volt conventional type ballasts at 220-250 volt conventional type ballast prices.

★ Automatic Reset, Nonblinking (FS-4NA) Starters can be supplied in place of FS-40 Starters at same unit list price. To order, suffix unit

Cat. Nos. ending in W with A.

Units with 6-foot Cord and Plug—To order, suffix unit Cat. Nos. with "C" for 2-wire cord (for 110-125V. units only) and plug and add \$1.70 to unit list price; for 3-wire cord and plug, suffix Cat. Nos. with "P" and add \$2.20. On units with "W" suffix, letters "C" or "P" are inserted before "W".

Lamps are not supplied.

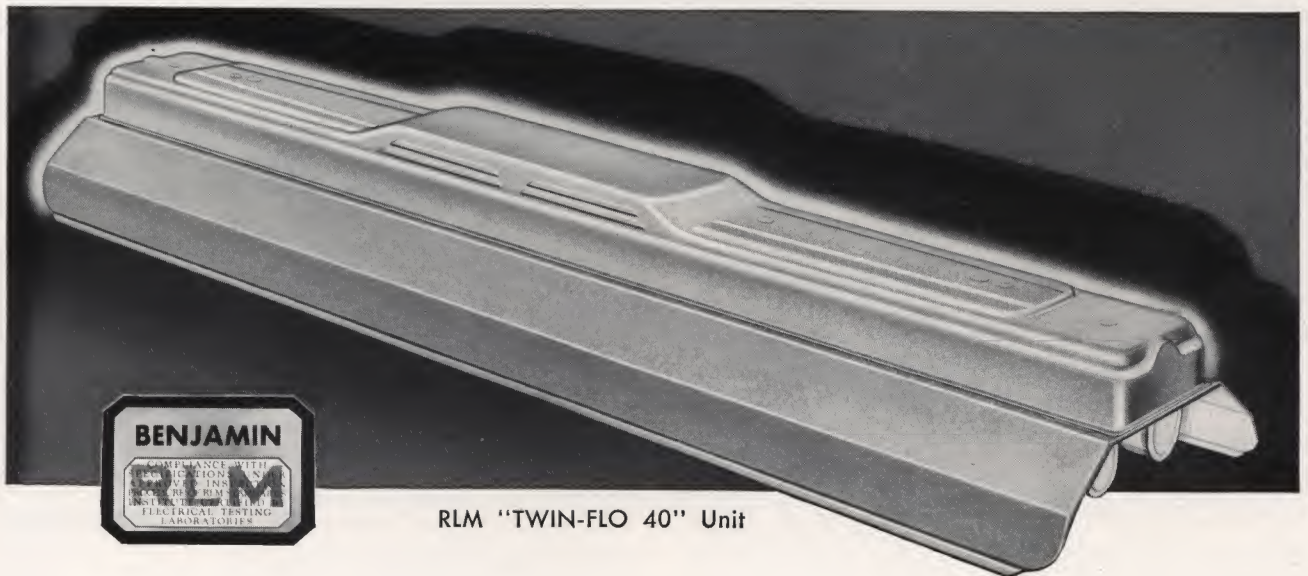
ACCESSORIES

Description	Suffix used to Specify Accessories on Complete Unit	Cat. No.	List Price
Levolver Fixt. Switch, No. 41, Single Pole 6 amp., 125V.; 3 amp., 250V.	LA	‡5261	\$1.60
Levolver Fixt. Switch, No. 276, Double Pole 6 amp., 125V.; 3 amp., 250V.	LB	‡5262	2.00
1 Pr. 5 ft. Hvy. Duty Chain Assemblies, Complete with Hooks	..	5243	1.10
Twin Stem Canopy Suspension (19 ¹ / ₂ " centers)	..	42040	6.00

‡ Catalog Number to be used when ordering switch separately.

"TWIN-FLO 40" and "TRIPLE-FLO 40" Units

"Series 40" Porcelain Enameled Open-end Units for
Two and Three 40-Watt Fluorescent Lamps



RLM "TWIN-FLO 40" Unit

Benjamin "Twin-Flo 40" and "Triple-Flo 40" fluorescent units, with open-end type porcelain enamel steel reflectors, provide excellent general illumination for industrial and commercial locations. Skillful engineering and precision manufacturing methods insure correct reflector contour, adequate shielding of lamps, maximum light output and long service.

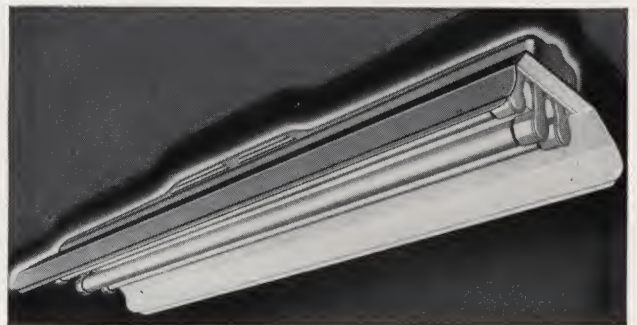
Type A or E Construction—"Twin-Flo 40" twin-lamp units are available in two reflector sizes designated as Type A and Type E. Type A reflectors are $50\frac{3}{4}$ -inches long by $11\frac{1}{2}$ -inches wide and accommodate lampholders with $3\frac{1}{2}$ -inch centers. Type E reflectors are $53\frac{3}{4}$ -inches long by $13\frac{1}{8}$ -inches wide and accommodate lampholders with 5-inch centers.

"Triple-Flo 40" triple-lamp units are available in Type E only using the identical reflectors furnished for Type E twin-lamp units above and a lamp center spacing of $2\frac{1}{2}$ -inches.

Separable Construction—The heavy duty porcelain enameled steel reflectors are easily removed from the rugged steel housings by a quarter turn of two adjustable hand operated "LOK-LATCH" reflector fasteners.

Ballast, and exclusive Benjamin "SPRINGLOX" safety type lamp holders are assembled to the steel housing, so that by simply removing the lamps, the reflector may be easily detached for cleaning. In installing the unit, the housing can first be put up and wiring connections completed. After that it is a simple mechanical connection to attach the reflector to the installed housing, by a quarter turn of the "LOK-LATCH" fasteners.

Exclusive Benjamin Lamp Holders—Most noteworthy among the features of "Twin-Flo 40" and "Triple-Flo 40" fluorescent lighting units are the exclusive Benjamin "SPRINGLOX" safety type lamp holders. These new safety type lamp holders offer a decided advancement in the ease of lamping and relamping fluorescent units and provide positive insurance against lamps dropping out. Lamp installation is the work of a moment. Simply slip one end of the lamp into the lamp holder equipped with a flexible spring base—this allows sufficient clearance for the contact prongs on the opposite end of the lamp to be slipped into the facing solid base type lamp holder. Pressure of the lifetime spring securely locks the lamp into position.



RLM "TRIPLE-FLO 40" Unit

(Issued September 19, 1949)

BENJAMIN • page 309

(From General Catalog)

Lighting Applications and Specifications

RLM "TWIN-FLO 40" and "TRIPLE-FLO 40" Units

Lighting Applications

In general lighting installations, "Twin-Flo 40" units for two 40-watt (48-inch) fluorescent lamps provide lighting levels from 22 to 53 footcandles at normal mounting and spacing. "Triple-Flo 40" units for three 40-watt (48-inch) fluorescent lamps provide approximately 37% more light, increasing lighting levels to 31 to 71 footcandles. These values are based on the use of "white" fluorescent lamps.

"Twin-Flo 40" and "Triple-Flo 40" fluorescent units are also widely used for local lighting. Mounted 30 to 36 inches above the working plane and equipped with "white" lamps, "Twin-Flo 40" units can provide up to 100 footcandles. Under similar conditions "Triple-Flo 40" units can provide up to 135 footcandles.

Light Output—The design of the reflector, high reflection factor (exceeding 82%) of the porcelain enamel, proper positioning of the lamps and other factors combine to give an efficiency for porcelain reflector units of 80% or more of the output of the lamps for the twin-lamp type, and 76% or more for the triple-lamp type.

Spacing of Lamps—On Type A twin-lamp units "SPRING-LOX" lamp holders are spaced on 3½-inch centers; on Type E twin-lamp units, lamp holders are spaced on 5-inch centers. On Type E triple-lamp units the outer lamps of the "SPRING-

LOX" lamp holder assembly are spaced on 5-inch centers, the third lamp is centered between and slightly below the two outer lamps.

Shielding Angle—On twin-lamp units, when a line is drawn perpendicular to the reflector edge and tangent to the lower edge of the opposite lamp, this line forms a shielding angle of 13 degrees. Triple-lamp units also have a 13 degree shielding angle.

For further shielding on twin-lamp units, white porcelain enameled longitudinal shields are available, which provide 23 degrees of crosswise shielding from the horizontal for Type A units and 27 degrees for Type E twin-lamp units. The longitudinal shield is easily and firmly positioned between the two lamps by means of two suspension arms which fit into two holes provided in the "LOK-LATCH" reflector fasteners. For listing of shields see page 312.

Specifications

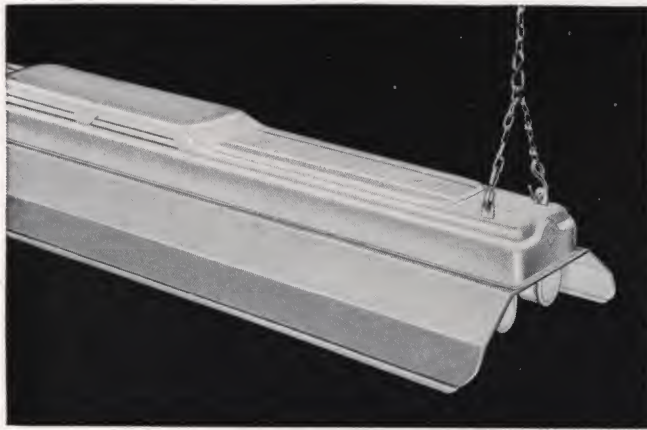
Streamlined Housings—Ballast and exclusive Benjamin safety type lamp holders are mounted in the one-piece streamlined housing which is drawn from 20 gauge steel. Inner and outer surfaces are finished in gray enamel.

Porcelain Enamel Reflectors—Reflectors are made of porcelain enameling iron, completely covered with Benjamin "lifetime" porcelain enamel—outer surfaces are finished in gray, inner surfaces are reflecting white.

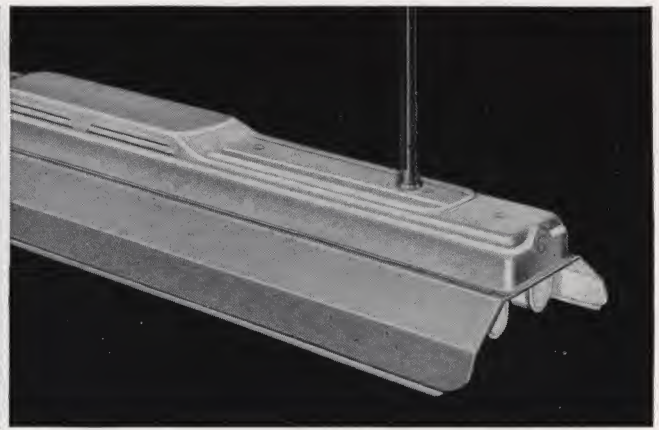


Illustrating how reflector is easily attached or removed from the one-piece steel housing by a quarter turn of the two hand operated "LOK-

LATCH" reflector fasteners. An aluminum grommet protects reflector finish. Control equipment remains an integral part of the housing.



Chain Mounting—Single or double chain supports can be attached to each end of the housing by means of two detachable angle mounting brackets.



Conduit Mounting—Any one of three pairs of conduit knockouts in the top of the housing can be utilized for attachment of one pair of rigid conduit stems.

Ballasts and Starters—Twin and triple-lamp units are listed with conventional type, high power factor, ballasts. Twin-lamp units are also available with twin-lamp, high power factor, instant starting ballasts. On units with conventional type ballasts, a removable non-blinking type or a standard type starter is supplied for each lamp. Non-blinking starters eliminate blinking and flickering of dying lamps. All starters are easily removed for inspection or replacement.

Power Consumption—Twin-lamp units with lamps and conventional type ballasts use approximately 100 watts. Triple-lamp units with lamps and conventional type ballasts use approximately 150 watts. Twin-lamp units with instant starting type ballasts and lamps use approximately 110 watts.

Flicker—All ballasts operate the lamps out of phase to minimize cyclic light flicker.

Wiring—Units are furnished wired and come either with 6-inch leads or a 6-foot length two or three-wire cord and plug set. Two-wire cord sets have a standard two pronged plug and are approved for use on 110-125 volt service only. Three-wire cord sets have a two pronged plug with a wire coming out the side for grounding to the outlet box. Cord sets are wired to the unit.

Provision for Grounding—Metal-to-metal bond is provided between electrical units and housing for grounding.

Methods of Suspension

Chain Mounting—Single or double chain supports can be attached to each end of the housing by means of two detachable angle mounting brackets (spaced on 46 $\frac{3}{4}$ -inch centers) supplied with the unit. Only welded or lock-link chain should be used for suspensions. For listing of such

a suspension, see Accessories, page 312. In wiring lead-in wires can be brought into the top of the housing, using one of the six conduit knockouts provided.

Conduit Mounting—Any one of three pairs of conduit knockouts in the top of the housing can be utilized for the attachment of two rigid conduit stems. One pair of $\frac{3}{8}$ -inch knockouts is spaced on 19 $\frac{1}{2}$ -inch centers. Another pair of $\frac{1}{2}$ -inch knockouts is spaced on 36-inch centers. The third pair of knockouts are $\frac{3}{4}$ -inch conduit size and are spaced on 33-inch centers. Any one of the knockouts in the top of the housing can also be utilized for installation of a Levolver Fixture Switch, listed on page 312, under Accessories.

Canopy Suspension—For a more decorative means of suspension, Catalog No. 42040 Twin-Stem Canopy Suspension, with stems of $\frac{5}{8}$ -inch O.D. welded steel tubing, spaced on 19 $\frac{1}{2}$ -inch centers, is recommended.

Assured Performance

Auxiliary control equipment is certified by Electrical Testing Laboratories and by the manufacturer. Ballasts, lampholders and starters, are listed separately by Underwriters' Laboratories, and complete units carry Underwriters' Inspection label. "Twin-Flo 40" and "Triple-Flo 40" units meet RLM specifications and bear the RLM label which is an assurance of uniform quality and light output.

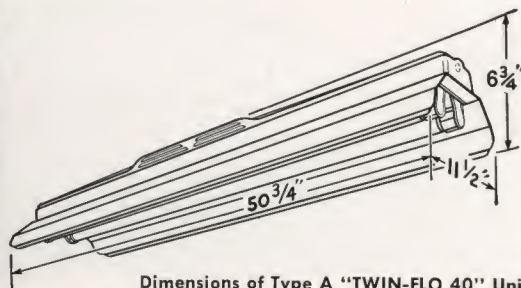
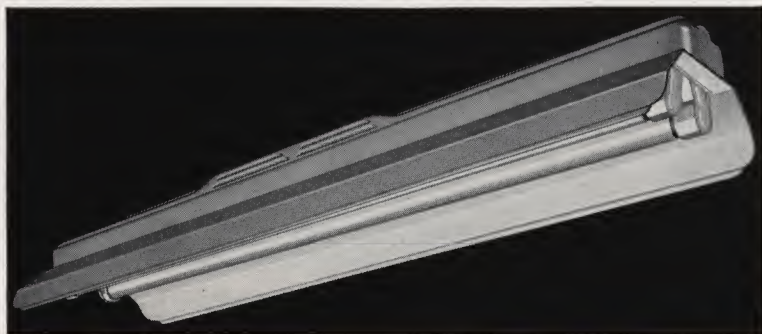
Guarantee—Benjamin lighting units when properly installed and under normal conditions of use, are guaranteed against mechanical and electrical defects for a period of one year from date of delivery to the purchaser, with the exception of the lamp starters for which the guarantee is limited to a period of 90 days. Correction of such defects by repair or replacement of material only shall constitute fulfillment of all obligations under this guarantee by the Benjamin Company.

(Issued September 19, 1949)

BENJAMIN page • 311

Benjamin RLM "TWIN-FLO 40" Units

Type A and Type E Open-end Units for Two 40-Watt (48-inch) Fluorescent Lamps



Dimensions of Type A "TWIN-FLO 40" Unit

(Dimensions of Type E: length, 53 3/4 inches; width, 1 3/8 inches; height, 7 1/8 inches.)

Type A Units with 50 3/4" x 1 1/2" Reflectors and 3 1/2" Lamp Center Spacing — Wired, with 6" Leads WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS★

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price	Consisting Parts	
					Housing No.	Reflec. No.
110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23	40162-W	\$26.80	N-162-W	8452
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23	40182-W	26.80	N-182-W	8452
WITH CONVENTIONAL BALLASTS AND STANDARD (FS-4) STARTERS						
110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23	40162	25.40	N-162	8452
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23	40182	25.40	N-182	8452
WITH INSTANT STARTING BALLASTS—NO LAMP STARTERS NEEDED						
110-125 Volts, 60 Cycle	1 Twin Lamp Ballast—95% Power Factor	26	40262	31.60	N-262	8452

Type E Units with 53 3/4" x 1 3/8" Reflectors and 5" Lamp Center Spacing — Wired, with 6" Leads WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS★

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price	Consisting Parts	
					Housing No.	Reflec. No.
110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23 1/2	40362-W	\$28.00	N-662-W	8453
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23 1/2	40382-W	28.00	N-682-W	8453
WITH CONVENTIONAL BALLASTS AND STANDARD (FS-4) STARTERS						
110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23 1/2	40362	26.60	N-662	8453
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23 1/2	40382	26.60	N-682	8453
WITH INSTANT STARTING BALLASTS—NO LAMP STARTERS NEEDED						
110-125 Volts, 60 Cycle	1 Twin Lamp Ballast—95% Power Factor	26 1/2	40462	32.80	N-762	8453

Units with 6-foot Cord and Plug — To order, suffix unit Cat. Nos. with "C" for 2-wire cord (for 110-125 V. units only) and plug and add \$1.70

to unit list price; for 3-wire cord and plug, suffix Cat. Nos. with "P" and add \$2.20. Lamps are not supplied.

Accessories

Description	Suffix used to Specify Accessories on Complete Unit	Cat. ‡ No.	List Price
Levolier Fixt. Switch, No. 41, Single Pole 6 amp., 125V., 3 amp., 250V.	LA	5261	\$1.60
Levolier Fixt. Switch, No. 276, Double Pole 6 amp., 125V., 3 amp., 250V.	LB	5262	2.00
1 Pr. 5 ft. Hvy. Duty Chain Assemblies, Complete with Hooks	....	5243	1.10
Longitudinal Shield for Type A units	....	8445	2.60
Longitudinal Shield for Type E units	....	8446	2.60
Twin Stem Canopy Suspension (19 1/2" centers)	....	42040	6.00

* 50 cycle ballast units supplied when specified at prices quoted upon application.

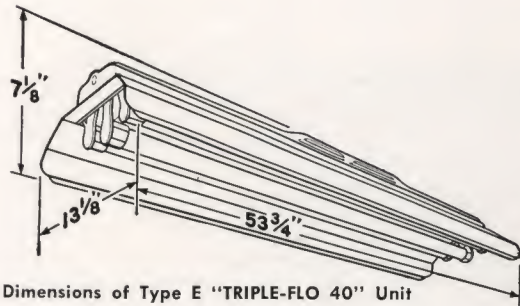
† Units supplied on special order with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional type ballast prices.

★ Automatic Reset, Nonlinking (FS-4NA) Starters can be supplied in place of FS-40 Starters at same unit list price. To order, suffix unit Cat. Nos. ending in "W" with "A."

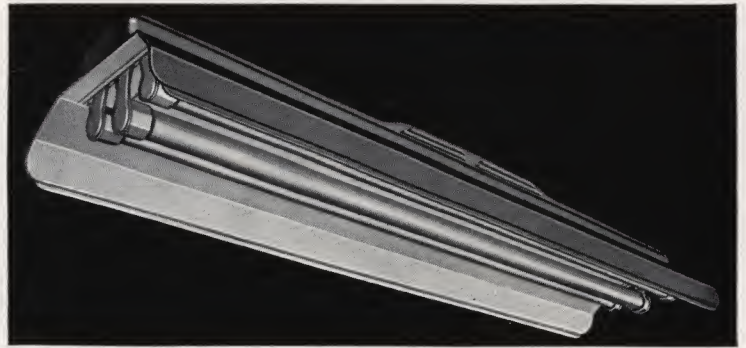
‡ Catalog Number used when ordering separately.

Benjamin RLM "TRIPLE-FLO 40" Units

Type E Open-end Units for Three 40-Watt (48-inch) Fluorescent Lamps



Dimensions of Type E "TRIPLE-FLO 40" Unit



Type E Units with 53 3/4" x 13 3/8" Reflectors and 2 1/2" Lamp Center Spacing — Wired, with 6" Leads
WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS★

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price	Consisting Parts	
					Housing No.	Ref. No.
110-125 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30	40163-W	\$37.70	N-663-W	8453
220-250 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30	40183-W	37.70	N-683-W	8453

WITH CONVENTIONAL BALLASTS AND STANDARD (FS-4) STARTERS

110-125 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30	40163	35.60	N-663	8453
220-250 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30	40183	35.60	N-683	8453

Type E Units with 53 3/4" x 13 3/8" Reflectors and 2 1/2" Lamp Center Spacing—Wired, with 6' Cord and Plug Cap
WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS★

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Two-Wire		Three-Wire	
			Cat. No. ‡	List Price	Cat. No. ‡	List Price
110-125 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30 1/2	40163-CW	\$39.40	40163-PW	\$39.90
220-250 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30 1/2	.....	.....	40183-PW	39.90

WITH CONVENTIONAL BALLASTS AND STANDARD (FS-4) STARTERS

110-125 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30 1/2	40163-C	37.30	40163-P	37.80
220-250 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30 1/2	.....	.....	40183-P	37.80

★ Consisting Parts: Reflector, No. 8453; Housing, same as for Units with 6-inch leads except add "C" suffix (for 2-wire) or "P" (for 3-wire) to the appropriate Housing Number.

* 50 cycle ballast units supplied when specified at prices quoted upon application.

† Units supplied on special order with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional type ballast prices.

★ Automatic Reset, Nonblinking (FS-4NA) Starters can be supplied in place of FS-40 Starters at same unit list price. To order, suffix unit Cat. Nos. ending in "W" with "A".

Accessories

Description	Suffix used to Specify Accessories on Complete Unit	Cat. ‡ No.	List Price
Levolier Fixt. Switch, No. 41, Single Pole 6 amp., 125V., 3 amp., 250V.	LA	5261	\$1.60
Levolier Fixt. Switch, No. 276, Double Pole 6 amp., 125V., 3 amp., 250V.	LB	5262	2.00
1 Pr. 5 ft. Hvy. Duty Chain Assemblies, Complete with Hooks	....	5243	1.10
Twin Stem Canopy Suspension (19 1/2" centers)	....	42040	6.00

‡ Catalog Number used when ordering separately.

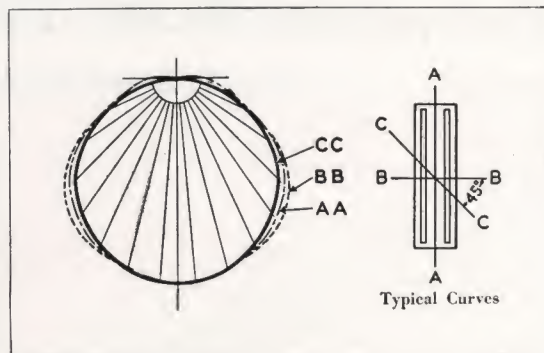
Lamps are not supplied.

Lighting Data

on "TWIN-FLO 40" and "TRIPLE-FLO 40" Units

Tables below are based on 40 watt (48-inch) 3500° "white" Mazda Fluorescent Lamps, 2300 lumens. (For 4500° "white" lamps, 2100 lumens, multiply values by .91: For 6500° "daylight" lamps, 1920 lumens, multiply values by .835). Mounting heights are distance above floor: footcandle values are on working plane 30 inches above floor.

Values are based on a minimum installation of 4 units and a maintenance factor of .75.



RLM "Twin-Flo 40" Units with 2 "White" Fluorescent Lamps of 2300 Lumens Each

Approximate Spacing	†Mounting height above floor	Area Per Unit	Room‡ Conditions	ROOM PROPORTIONS**					
				Average Footcandles on Horizontal					
7'x 7'	7'-6" to 9'-6"	49 Sq. Feet	very light fairly light fairly dark	FAVORABLE	49-53	AVERAGE	45-48	UNFAVORABLE	32-36
					48-49		39-45		26-32
					46-48		35-39		24-26*
8'x 8'	8'-0" to 10'-6"	64 Sq. Feet	very light fairly light fairly dark		37-39		34-37		24-27
					36-37		31-34		19.7-24
					35-36		27-31		18.6-19.7*
9'x 9'	8'-6" to 11'-6"	81 Sq. Feet	very light fairly light fairly dark		30-32		26-30		19.0-22
					28-30		24-26		15.3-19.0
					27-28		21-24		14.5-15.3*
10'x10'	9'-6" to 12'-6"	100 Sq. Feet	very light fairly light fairly dark		24-25		22-24		15.3-17.6
					23-24		19.3-22		12.7-15.3
					22-23		17.2-19.3		11.7-12.7*
11'x11'	10'-0" to 13'-6"	121 Sq. Feet	very light fairly light fairly dark		19.9-21		18.0-19.6		12.7-14.6
					19.4-19.9		16.0-18.0		10.5-12.7
					18.5-19.4		14.2-16.0		10.1-10.5*
12'x12'	10'-6" to 14'-6"	144 Sq. Feet	very light fairly light fairly dark		16.8-17.7		15.1-16.5		10.9-12.6
					16.2-16.8		13.4-15.1		9.6-10.9
					15.6-16.2		11.9-13.4		8.4- 9.6*

RLM "Triple-Flo 40" Units with 3 "White" Fluorescent Lamps of 2300 Lumens Each

7'x 7'	7'-6" to 9'-6"	49 Sq. Feet	very light fairly light fairly dark	FAVORABLE	67-71 66-67 62-66	AVERAGE	60-65 54-60 48-54	UNFAVORABLE	45-53 39-45 35-39*
8'x 8'	8'-0" to 10'-6"	64 Sq. Feet	very light fairly light fairly dark		51-55 50-51 48-50		47-49 42-47 37-42		35-39 30-35 26-30*
9'x 9'	8'-6" to 11'-6"	81 Sq. Feet	very light fairly light fairly dark		41-43 39-41 38-39		37-39 33-37 30-33		27-32 24-27 21-24*
10'x10'	9'-6" to 12'-6"	100 Sq. Feet	very light fairly light fairly dark		33-35 32-33 31-32		30-32 26-30 24-26		22-25 19.2-22 17.1-19.2*
11'x11'	10'-0" to 13'-6"	121 Sq. Feet	very light fairly light fairly dark		27-28 26-27 25-26		24-26 22-24 19.5-22		18.4-21 15.9-18.4 14.1-15.9*
12'x12'	10'-6" to 14'-6"	144 Sq. Feet	very light fairly light fairly dark		23-24 22-23 21-22		21-22 18.4-21 16.4-18.4		15.4-17.7 13.4-15.4 11.8-13.4*
13'6"x13'6"	11'-6" to 16'-0"	182 Sq. Feet	very light fairly light fairly dark		18.1-19.2 17.6-18.1 16.9-17.6		16.3-17.4 14.6-16.3 13.0-14.6		12.0-14.0 10.5-12.0 9.4-10.5*
15'x15'	12'-6" to 17'-6"	225 Sq. Feet	very light fairly light fairly dark		14.7-15.6 14.2-14.7 13.6-14.2		13.3-14.1 11.8-13.3 10.5-11.8		9.9-11.5 8.5- 9.9 7.6- 8.5*

* IMPRACTICAL—It is recommended that interior room conditions be improved or provision made for more frequent maintenance.

† Minimum heights shown are for spacing ratio of 1½ to 1. The greater heights are for 1 to 1 spacing.

‡ ROOM CONDITIONS—To determine condition of walls and ceilings consult chart in Section 1, General Catalog.

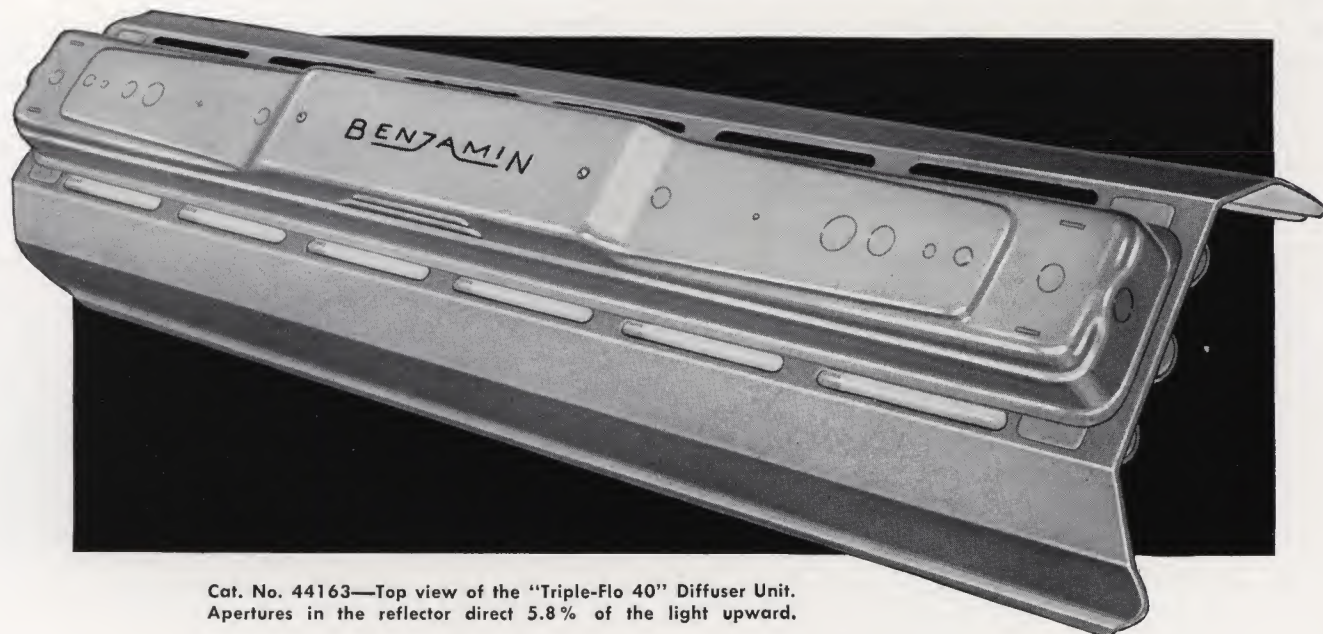
** ROOM PROPORTIONS—Use "Favorable" for broad rooms where width is about four times mounting height above floor.

Use "Average" where room width is about twice the mounting height above floor.

Use "Unfavorable" for narrow rooms where width is about equal to mounting height above floor.

"Twin-Flo 40" & "Triple-Flo 40" Diffusers

Type E Porcelain Enameled, Open-End Units with Apertures Directing Part of the Light Upward for Better Brightness Control



Cat. No. 44163—Top view of the "Triple-Flo 40" Diffuser Unit. Apertures in the reflector direct 5.8% of the light upward.

These Benjamin Open-End Lighting Units have all of the excellent lighting characteristics of the conventional "Twin-Flo 40" and "Triple-Flo 40" units for general and local illumination plus the addition of apertures which cut down high brightness contrasts and thus provide better "seeing" conditions in the general illumination of industrial and commercial locations.

These twelve apertures (arranged in two rows of six each) in the top of the reflector direct upward 6.7% of the total light output of the twin-lamp unit and 5.8% of the triple-lamp unit to soften contrast, increase eye comfort, and make the room more cheerful.

Among the other features of these units is the exclusive, Benjamin "Springlox" lampholder which provides fast, easy relamping and locks lamps safely in place. Another feature is the hand-operated "Lok-Latch" reflector fasteners. With lamps removed, one quarter turn of the two "Lok-Latch" thumb nuts releases the reflector for removal and exposes the control equipment in the housing.

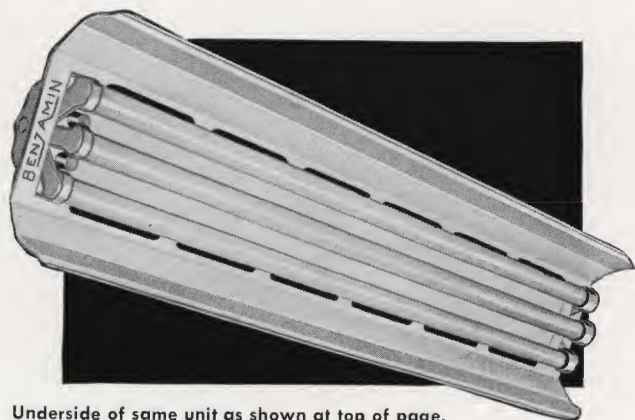
SPECIFICATIONS

Streamlined Housing—Ballast and exclusive Benjamin safety type lampholders are mounted in the one-piece streamlined housing which is drawn from 20 gauge steel. Inner and outer surfaces are finished in baked, gray enamel.

Porcelain Enamel Reflectors—Reflectors are made of 20 gauge steel, completely covered with Benjamin "lifetime" porcelain enamel—outer surfaces are finished in gray, inner surfaces in reflecting white. Twelve elongated apertures in two rows of six each pierce the top of the reflector.

Efficiency—The design of the reflector, proper positioning of the lamps, high reflection factor of the porcelain enamel (exceeding 82%), location and size of apertures and other factors combine to give an efficiency of 77% or more of the combined output of the lamps in the 0° to 90° zone and a minimum of 5.6% in the 90° to 180° zone from the twin-lamp unit. For the triple lamp unit, the efficiency is 74% in the 0° to 90° zone and a minimum of 4.6% in the 90° to 180° zone.

Additional Information—For additional specifications and data, please refer to Specifications of the "Twin-Flo 40" and "Triple-Flo 40" units to be found on pages 309 and 311.



Underside of same unit as shown at top of page.

(Issued September 19, 1949)

BENJAMIN • page 315

(From General Catalog)

"Twin-Flo 40" & "Triple-Flo 40" Diffusers

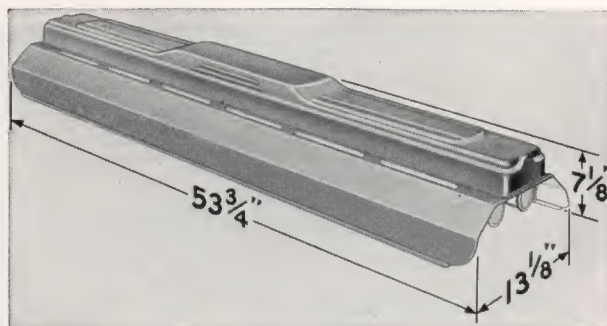
Type E Twin and Triple-Lamp, Porcelain Enameled, Open-End Units with Apertures

METHODS OF SUSPENSION

Chain Mounting—Single or double chain supports can be attached to each end of the housing by means of two detachable angle mounting brackets (spaced on 46³/₄-inch centers) supplied with the unit. For listing of such a suspension, see Accessories below.

Conduit Mounting—Conduit knockouts for the insertion of rigid conduit stems are spaced as follows: One pair of ³/₈-inch knockouts on 19¹/₂-inch centers; one pair of ¹/₂-inch knockouts on 36-inch centers; one pair of ³/₄-inch knockouts on 33-inch centers.

Canopy Suspension—For a more decorative means of suspension Catalog No. 42040 Twin-Stem Canopy Suspension, with ³/₈-inch stems spaced on 19¹/₂-inch centers, is recommended.



TYPE E TWIN-LAMP UNITS WITH 53 ³/₄" x 13 ¹/₈" REFLECTORS AND 5" LAMP CENTERS—WIRED WITH 6" LEADS With Conventional Ballasts and Standard (FS-4) Starters

Line Voltage†	Control Equipment	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
					Housing No.	Refl. No.
110-125 Volts, 60 Cycles*	1 Twin-Lamp Ballast—95% Power Factor	22½	44362	\$27.10	N-662	8444
220-250 Volts, 60 Cycles*	1 Twin-Lamp Ballast—95% Power Factor	22½	44382	27.10	N-682	8444

With Conventional Ballasts and Manual Reset, Nonblinking (FS-40) Starters★

110-125 Volts, 60 Cycles*	1 Twin-Lamp Ballast—95% Power Factor	22½	44362-W	\$28.50	N-662-W	8444
220-250 Volts, 60 Cycles*	1 Twin-Lamp Ballast—95% Power Factor	22½	44382-W	28.50	N-682-W	8444

With Instant Starting Ballasts—No Lamp Starters Needed

110-125 Volts, 60 Cycles*	1 Twin-Lamp Ballast—95% Power Factor	25½	44462	\$33.30	N-762	8444
---------------------------	--------------------------------------	-----	-------	---------	-------	------

TYPE E TRIPLE-LAMP UNITS WITH 53 ³/₄" x 13 ¹/₈" REFLECTORS AND 2 ¹/₂" LAMP CENTERS—WIRED WITH 6" LEADS With Conventional Ballasts and Standard (FS-4) Starters

Line Voltage†	Control Equipment	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
					Housing No.	Refl. No.
110-125 Volts, 60 Cycles*	1 Triple-Lamp Ballast—95% Power Factor	29½	44163	\$36.10	N-663	8444
220-250 Volts, 60 Cycles*	1 Triple-Lamp Ballast—95% Power Factor	29½	44183	36.10	N-683	8444

With Conventional Ballasts and Manual Reset, Nonblinking (FS-40) Starters★

110-125 Volts, 60 Cycles*	1 Triple-Lamp Ballast—95% Power Factor	29½	44163-W	\$38.20	N-663-W	8444
220-250 Volts, 60 Cycles*	1 Triple-Lamp Ballast—95% Power Factor	29½	44183-W	38.20	N-683-W	8444

Units with 6-foot Cord and Plug—To order, suffix unit Cat. Nos. with "C" for 2-wire cord (for 110-125 V. units only) and plug and add \$1.70 to unit list price; for 3-wire cord and plug, suffix unit Cat. Nos. with "P"

and add \$2.20. On unit Cat. Nos. ending in "W", insert "C" or "P" before the "W".

ACCESSORIES

Description	Suffix used to Specify Accessories on Complete Unit	Cat. No.	List Price
Levolier Fixt. Switch, No. 41, Single Pole 6 amp., 125V., 3 amp., 250V.	LA	5261†	\$1.60
Levolier Fixt. Switch, No. 276, Double Pole 6 amp., 125V., 3 amp., 250V.	LB	5262†	2.00
1 Pr. 5 ft. Hvy. Duty Chain Assemblies, Complete with Hooks	.....	5243	1.10
Twin Stem Canopy Suspension (19½" Centers and 24" Stems)	.....	42040	6.00
Longitudinal Shield (For Twin-Lamp Units Only)	.....	8445	2.60

†Catalog Number used when ordering separately.

Lamps are not supplied.

* 50 cycle ballast units supplied at prices quoted upon application.

† Units supplied on special order with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional type ballast prices.

★ Automatic Reset, Nonblinking (FS-4NA) Starters can be supplied in place of FS-40 Starters at same unit list price. To order, suffix unit Cat. Nos. ending in "W" with "A."

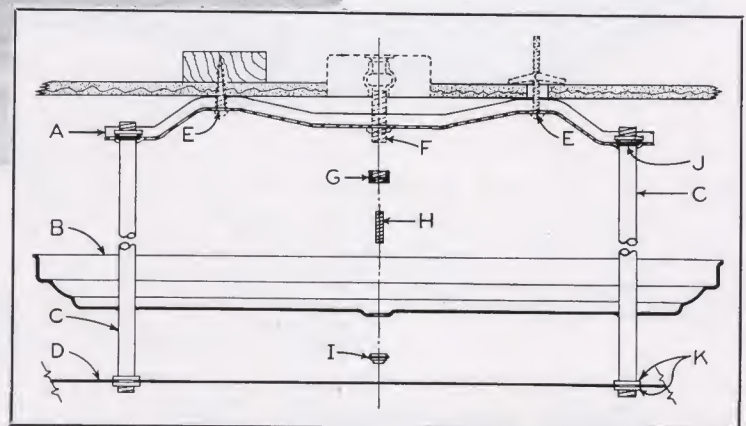
Benjamin Twin-Stem Canopy Suspensions

for "Series 40"
fluorescent units



Cat. No. 42040
(Suspension Only)

This Benjamin Twin-Stem Canopy Suspension, with its modern styling and attractive aqua chrome finish, is particularly suited for offices and commercial establishments and can be used with Benjamin "Stream-Flo 40", "Shield-Flo 40", "Twin-Flo 40", "Triple-Flo 40", "Rex-Lite 40", and any other unit having $\frac{3}{8}$ -inch iron pipe size knockouts spaced on 19½-inch centers.



These combination suspensions and aligners provide an attractive and effective means of suspending commercial and industrial fluorescent units from ceiling outlet boxes. Suspensions are designed for quick and easy installation with a minimum of tools and the entire assembly may be supported from the fixture stud during installation, leaving both hands free for wiring. Moreover, the wiring can be inspected at any time, without detaching the suspension, by removing a single cap nut.

CONSTRUCTION

The twin stems (C), $\frac{5}{8}$ -inch O.D. steel tubing, are supported independently of the ornamental canopy (B) by a formed steel inner channel (A) which can be easily attached to either a deep or shallow ceiling outlet box by using a lock nut and a $\frac{3}{8}$ -inch nipple (F) threaded into a hickey supported from a fixture stud in the outlet box. (The nipple, lock nut and hickey are not furnished.) The support chan-

nel may also be fastened directly to the ceiling with screws or bolts by using the two $\frac{5}{16}$ -inch holes (E) near the channel ends. Screws or spring wing toggle bolts may also be used in the holes in the channel ends to prevent twisting when the outlet box method of installation is used.

The ornamental canopy, which covers the inner channel, is held in place by an ornamental nut (I), a $\frac{1}{8}$ -inch nipple (H) and a $\frac{3}{8}$ " to $\frac{1}{8}$ " reducer coupling (G) which fastens to the $\frac{3}{8}$ -inch nipple (F).

The upper ends of the stems are supported by curved lock nuts (J) which fit into cup-shaped recesses in the support channel, providing sufficient aligner action to level the unit.

The lower ends of the stems are threaded and slip thru $\frac{3}{8}$ -inch iron pipe size knockouts in the unit housing and are secured by two lock nuts (K). Stems and canopy are finished in aqua chrome and stems are available in lengths indicated below.

Canopy Dimensions, Inches			Stem Length, Inches	Ceiling to Fixture Top, Inches	Cat. No.	List Price	Consisting Parts	
Length	Width	Depth					Canopy	Stems*
27 $\frac{3}{16}$	51 $\frac{1}{16}$	2	24	24 $\frac{5}{8}$	42040	\$ 5.50	†.....	†.....
27 $\frac{3}{16}$	51 $\frac{1}{16}$	2	48	48 $\frac{5}{8}$	42045	7.90	42030	42031
27 $\frac{3}{16}$	51 $\frac{1}{16}$	2	72	72 $\frac{5}{8}$	42046	10.30	42030	42032

* Two stems are supplied with each suspension.

† Cat. No. 42040 packed as complete item.

(Issued April 12, 1948) • net schedule 2-F

BENJAMIN • page 473

(From Catalog 26)

Benjamin Hinged Covers for Dust Protection

for "Series 40" fluorescent units

These hinged type glass covers can be used with Benjamin twin or triple lamp "Stream-Flo 40" units, "Shield-Flo 40" units and Type E twin and triple lamp "Lite-Line 40" systems with closed-end reflectors.

Cat. No. 8496
(Cover Only)



These covers can readily be attached to the unit on the job with a minimum of tools and effectively seal the bottom opening of the reflector against the entrance of dirt or grime. Maintenance is thereby simplified and cleaning time is materially reduced.

SIMPLE TO ATTACH

To attach, loosen a screw near each end of the hinged section of the frame which frees two locking levers, allowing them to be swung downward. The hinged side of the frame is then hooked over the reflector flange and the cover is shut and held by closing the cover clamps. The two locking levers are then inserted between the cover frame and the reflector flange and the locking screw of each is tightened. For relamping simply release five cover clamps.



OPAL COVERS REDUCE BRIGHTNESS

Opal glass covers are primarily for use where a large light source of low and uniform surface brightness is desired. They reduce the brightness of 40-watt lamps by approximately one-half and can be used in installations where unusual diffusion is desired, such as over drafting tables or where inspection and manufacturing operations must be performed on polished, plated or shiny surfaces.

Naturally, there is some light absorption by the glass

covers. For lighting data, use "Stream-Flo 40" values as a basis and multiply them by .88 for clear glass and .6 for opal glass covers.

CONSTRUCTION

Covers consist of a steel frame; one side of which has a series of five spring hinges fastened to a clamping arrangement, while the other side has a series of five spring clamps. Attached to the cover glass is a grooved extruded rubber gasket. The glass and gasket are attached to the frame with bronze wire clips. A choice of double strength clear glass or opal glass is available. The frame is finished in baked gray enamel.

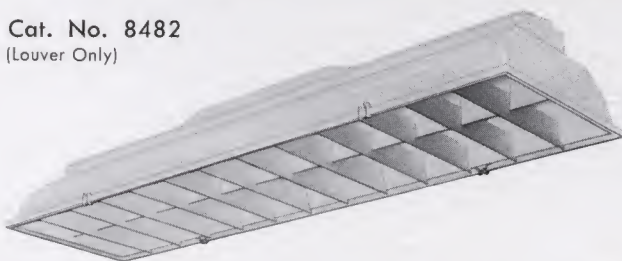
Description*	Dimensions, Inches		Cat. No.	List Price
	Length	Width		
Complete Cover with Plain, Clear Glass	53 1/4	12 21/32	8496	\$16.50
Complete Cover with Opal Glass	53 1/4	12 21/32	8497	20.80
Clear Glass only, with Gasket; for replacement	53 1/16 †	12 15/32 †	8498	7.20
Opal Glass only, with Gasket; for replacement	53 1/16 †	12 15/32 †	8499	11.50

* Covers will not fit old style "Stream-Flo 48" and "Lite-Line 48" reflectors.

† Dimensions include gasket.

Louvers for "Series 40" Fluorescent Units

Cat. No. 8482
(Louver Only)



While the shielding angle of Benjamin fluorescent units is satisfactory for most lighting applications, there are occasional installations where a lower shielding angle may be desired. For this purpose Benjamin louvers have been designed for 40-watt lamp size units of the following types: twin and triple lamp "Stream-Flo 40" Units; "Triple-Flo 40" Units; Type E twin and triple lamp "Lite-Line 40" Systems, using either open-end or closed-end reflectors.

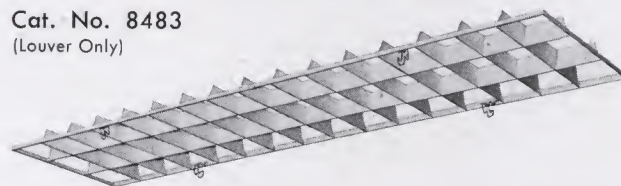
Louvers for the twin-lamp units provide a crosswise

shielding angle of 25 degrees and a lengthwise shielding angle of 25 degrees. Louvers for triple-lamp units provide a crosswise shielding angle of 19 degrees and a lengthwise shielding angle of 23 degrees.

Louvers are of steel and are easily attached directly below the lamps without the use of tools. They are held securely in position by two hand-operated, spring wire clamps on each side of the louver frame. The sections are welded together, assuring a rigid assembly.

Louvers are finished in 80% reflection factor white baked enamel: wire clamps are metal plated.

Cat. No. 8483
(Louver Only)



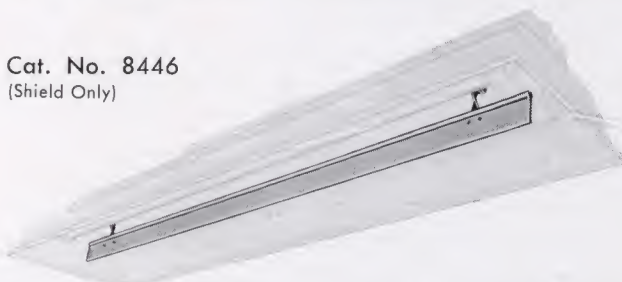
Description†	Dimensions, Inches			Cat. No.	List Price
	Length	Width	Height		
For 40-Watt Twin-lamp Units*	53¼	12 ²³ / ₃₂	2½	8482	\$6.20
For 40-Watt Triple-lamp Units	53¼	12 ²³ / ₃₂	1 ¹³ / ₃₂	8483	7.50

* Will not fit 11½-inch reflectors of "Twin-Flo 40" Units or Type A, Twin-lamp "Lite-Line 40" System Reflectors.

† These louvers will not fit old style "48000 Series" Units, such as Nos. 48662-N, 48663-N, etc. or old style "Lite-Line 48" reflectors.

Longitudinal Shields for "Series 40" Fluorescent Units

Cat. No. 8446
(Shield Only)



These longitudinal shields are designed for use with 40-watt lamp size units of the following types: "Twin-Flo 40" Units; Type A twin-lamp "Lite-Line 40" Systems, with Number 8452 open-end reflectors; twin-lamp "Stream-Flo 40" Units; Type E twin-lamp "Lite-Line 40" Systems, with Number 8453 open-

end or Number 8462 closed-end reflectors; all of which have a crosswise shielding angle of 13 degrees.*

Where a deeper shielding than 13 degrees is desired, these shields, which provide transverse shielding angles of 23 and 27 degrees, may be firmly positioned between the lamps, without tools, by means of two suspension arms. The two small fingers of the movable suspension arm are inserted into the holes in the "Lok-Latch" reflector fastener. The shield is pushed forward compressing a spring behind the arm and permitting the stationary arm to be inserted in the holes of the opposite "Lok-Latch" fastener.

The shield is made of porcelain enameling iron covered with white porcelain enamel having a matte finish with a reflection factor of 79%.

Description	Dimensions, Inches		Shielding Angle, Degrees	Cat. No.	List Price
	Length	Height †			
For Twin-lamp "Twin-Flo 40" Units and Type "A", Twin-lamp "Lite-Line 40" Reflectors, No. 8452	48¾	1¾	23	8445	\$2.40
For Twin-lamp "Stream-Flo 40" Units and Type E, Twin-lamp "Lite-Line 40" Reflectors, Nos. 8462, 8453	48¾	2	27	8446	2.40

* No. 8446 shield supplied as standard equipment on "Shield-Flo 40" Units listed on page 429.

† Height of shield without arms.

Chain Suspension for Fluorescent Units



Cat. No. 5243
(Suspension Only)

These 5 ft. heavy duty "Y" type chain supports for suspension of the "Stream-Flo 40", "Shield-Flo 40", "Twin-Flo 40" and "Triple-Flo 40" units can be attached to each end of the unit housing by means of two detachable angle mounting brackets supplied with the units.

Chain is made of 14 gauge steel wire with galvanized finish.

Description	Cat. No.	List Price
1 pr. 5 ft. Hvy. Duty Chain Assemblies, Complete with Hooks	5243	\$1.00

Ceiling Strap for Fluorescent Units



Cat. No. 18431
(Strap Only)

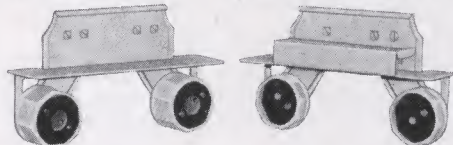
These Offset Ceiling Straps afford a convenient means of stationary suspension of all "Series 40" units except Type "TX-40" and "II-G Sealed-Flo 40".

These straps have an offset of $1\frac{3}{8}$ -inches and are of formed steel finished in baked gray enamel. They can be connected directly to knockouts in the unit housing and fastened flush to the ceiling with bolts or screws by using the $\frac{25}{64}$ -inch holes spaced on $7\frac{1}{2}$ -inch centers provided. These straps can also be used as a basis for single or twin-rod suspensions; see pages 462 and 463.

Description	Cat. No.	List Price
With Center Hole for $\frac{3}{8}$ " Rod or $\frac{5}{16}$ " Bolt*	18431	\$0.40

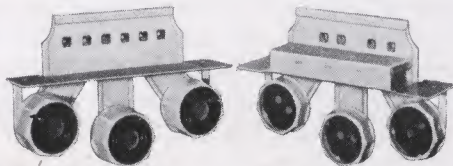
* $5/16$ " nut and bolt supplied. For dimensional data see page 463.

"Springlox" Fluorescent Lampholder Assemblies



Cat. No. 4042

Cat. No. 4052



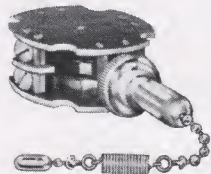
Cat. No. 4043

Cat. No. 4053

These one piece, safety-type, metal-clad lampholders for two or three lamps are heavy cadmium plated and finished in baked white enamel. For replacement only.

Number of Lamps	Type of Ballast	Lamp Spacing, Inches	Push End		Solid End	
			Cat. No.	List Price	Cat. No.	List Price
Two	Conv.	$3\frac{1}{2}$	4002	\$2.40	4012	\$2.20
Two	Inst. Start.	$3\frac{1}{2}$	4022	2.30	4032	2.10
Two	Conv.	5	4042	2.70	4052	2.50
Three	Conv.	$2\frac{1}{2}$	4043	3.70	4053	3.40
Two	Inst. Start.	5	4062	2.40	4072	2.20

Levolier Switches for Fluorescent Units



Cat. No. 5261



Cat. No. 5262

Supplied, when specified, on most Benjamin Fluorescent Equipment. Not sold separately except for replacement.

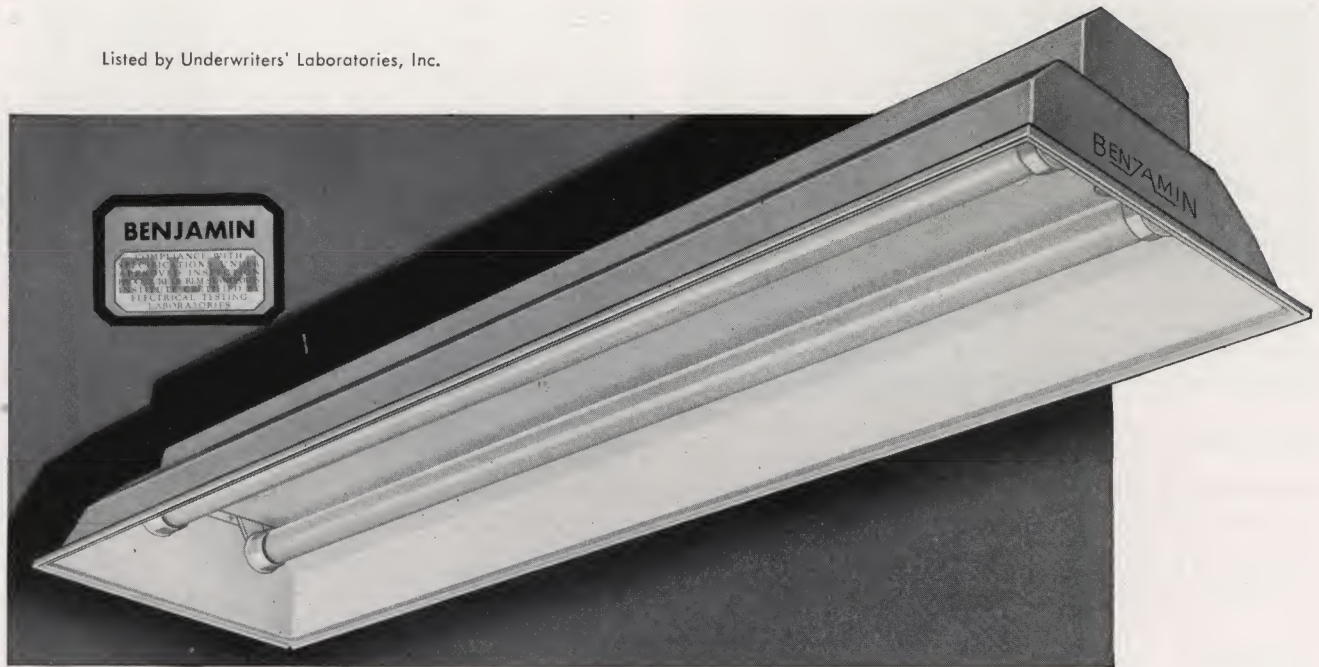
Description	Suffix used to Specify Switches on Complete Unit	Cat. No.	List Price
No. 41, Single Pole 6 amp., 125V.; 3 amp., 250V.*	LA	5261	\$1.50
No. 276, Double Pole 6 amp., 125V.; 3 amp., 250V.*	LB	5262	1.80

* Supplied with 7 ft. cord.

Benjamin Improved RLM "TX-40" Units

With One-Piece Porcelain Enameled Steel Housings

Listed by Underwriters' Laboratories, Inc.



Two-Lamp "TX-40" Unit

For lighting: Textile Mills • Paper Mills • Food Plants • Laundries • Bottling Plants • Meat Packing Plants • Other Locations with Damp and Humid Atmospheres

These Improved "TX-40" Units incorporate several outstanding improvements in addition to retaining the advantages of the previous design.

Among the more important improvements are the inclusion of the exclusive Benjamin "Springlox" Lampholder assembly and attachment of control equipment to the inside of the top of the housing.

DESIGNED FOR USE IN HUMID, DAMP ATMOSPHERES

Benjamin RLM "TX-40" Lighting Units are designed to effectively illuminate locations with humid, damp atmospheres.

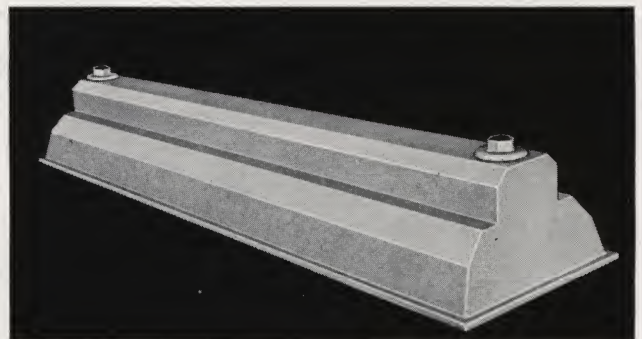
In such locations, water vapor from the air tends to condense on the top of the metal lighting unit. Accumulations of this moisture can seriously shorten the life of a lighting unit by rusting the housing.

"TX-40" Units effectively combat this condition by the use of one-piece construction which provides an unbroken, exterior surface. There are no openings or crevices in which moisture can accumulate and cause rust.

Threaded conduit suspension flanges on the top of these

units are also designed to prevent the entrance of moisture at their joints.

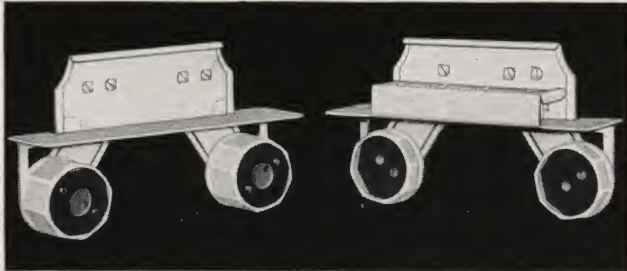
To provide further protection against the effects of moisture "TX-40" Units are completely coated with durable porcelain enamel. Besides furnishing lifetime protection of the unit against rust and corrosion, porcelain enamel provides reflecting surfaces which maintain their original high lighting efficiency indefinitely, with occasional soap and water cleaning. Porcelain enamel will not discolor with age and will not scratch or mar with normal handling.



Top view of RLM "TX-40" Unit showing one-piece construction and threaded conduit suspension flanges. Note the absence of any opening in the reflector-housing into which moisture could seep.

Features and Lighting Data

For Improved Benjamin RLM "TX-40" Lighting Units



Exclusive Benjamin, one-piece, metal-clad, safety type lampholder assembly regularly supplied with "TX-40" Units. (Left) Flexible spring base end of two-lamp "Springlox" assembly. (Right) Solid base end of two-lamp "Springlox" assembly.

FEATURES

One-Piece Construction—Unit housings are of one-piece porcelain enameled steel construction. A pair of flanges on the top of the housing provides for conduit suspension and passage of lead wires into the housing without danger of seepage into the housing.

"Springlox" Lampholders—Lamping and relamping units is made simple by the use of exclusive, Benjamin "SPRINGLOX" lampholders. One end of the lamp is inserted into the lampholder with the spring base. This allows sufficient clearance for the pins on the opposite end of the lamp to slip into the facing lampholder, having a solid base. Pressure of the lifetime spring securely locks the lamp in position.

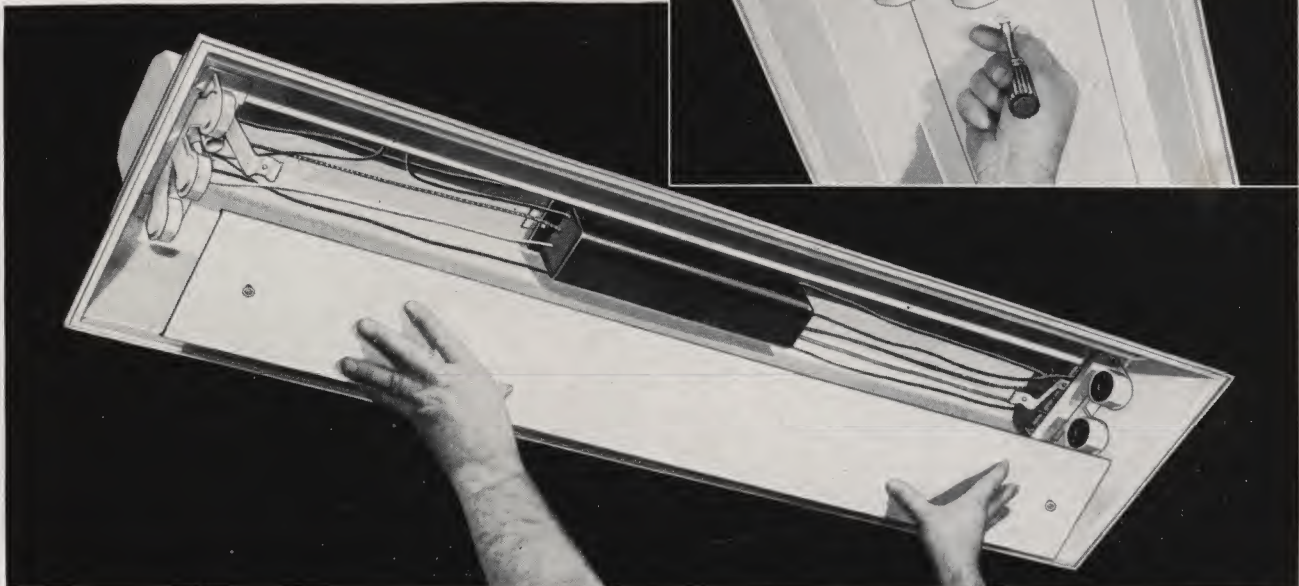
Easy to Install—Units are shipped assembled. Before installation, the inner porcelain enameled reflector plate, which is attached to brackets on the housing by two screws, is removed. This exposes the control equipment for quick, easy wiring. After the unit is suspended and wiring connections completed, the reflector plate is replaced and lamps and starters are inserted.

LIGHTING DATA

These units are available in arrangements for either two or three 48-inch, 40-watt fluorescent lamps. In general lighting installations, two-lamp "TX-40" units provide lighting levels ranging from 21 to 50 footcandles at normal mounting and spacing. Three-lamp units provide lighting levels ranging from 29 to 68 footcandles at normal mounting and spacing.

"TX-40" units can also be used for local lighting of inspection tables, production lines and machines. Mounted 30 to 36 inches above the surface to be lighted and equipped with "white" lamps, the two-lamp unit can provide lighting levels up to 100 footcandles. Under similar conditions, the three-lamp unit can provide up to 140 footcandles.

Light Output—The design of the reflector, high reflection factor (exceeding 82%) of the porcelain enamel and other factors combine to give an efficiency of 79% or more of the output of the lamps for two-lamp units and 72% or more for three-lamp units. All units have a 13-degree shielding angle.



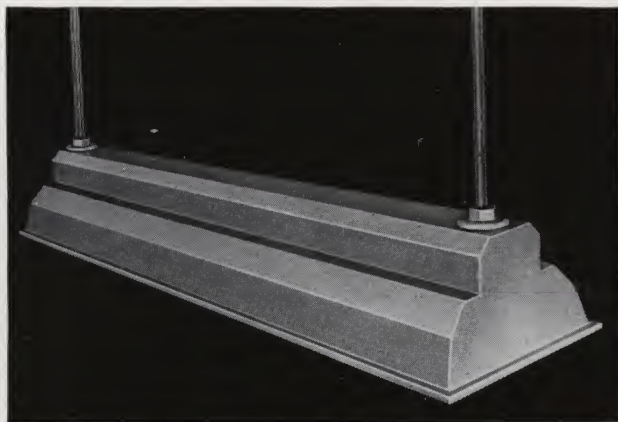
Loosening two screws allows the porcelain enameled reflector plate to be quickly detached. Wiring, ballast and lampholders are then exposed for easy checking.

Specifications

For Improved Benjamin RLM "TX-40" Fluorescent Units



Lamp insertion is quick, easy, positive. No danger of lamp vibrating loose from the "Springlox" lampholder. Inset shows flexible, spring base end of the lampholder.



Two cast iron, threaded, suspension flanges with iron pipe tapings are provided for attachment of rigid conduit stems.

One-piece Reflector-Housing—Reflector-housing is of welded steel construction finished in enduring porcelain enamel. The top of the reflector is formed by a porcelain enameled steel plate, which is removed for access to the control equipment (mounted on the inside top of the reflector-housing) by loosening two screws.

Spacing of Lamps—On two-lamp units "SPRINGLOX" lampholders space lamps on 5-inch centers. On three-lamp units the outer lamps are spaced on 5-inch centers and the third lamp is centered between and slightly below the two outer lamps.

Ballasts and Starters—Two and three-lamp units are listed with conventional type, high power factor ballasts. Twin-lamp units are also available with twin-lamp, high power factor, instant-starting ballasts. On units with conventional type ballasts, either a non-blinking type or a standard type starter is supplied for each lamp. All starters are easily removed for inspection or replacement.

Flicker—All ballasts operate the lamps out of phase to minimize cyclic light flicker.

Power Consumption—Two-lamp units with lamps and conventional type ballasts use approximately 100 watts; with instant-starting type ballasts and lamps, approximately 110 watts. Three-lamp units with lamps and conventional type ballasts use approximately 150 watts.

Wiring—All units are wired and have 6-inch leads.

Provision for Grounding—Metal to metal bonds ground unit through conduit system.

Finish—Housing is finished in gray porcelain enamel outside; reflecting surfaces are a special diffusing white. Suspension flanges are finished in baked enamel over cadmium plate. All other metal fittings are cadmium plated. Lampholders are finished in white enamel over cadmium plate.

MOUNTING

Units have two cast iron suspension flanges with conduit stops spaced on $47\frac{1}{2}$ -inch centers, tapped $\frac{1}{2}$ -inch iron pipe size; $\frac{3}{4}$ -inch, if specified. One is for a dummy conduit stem and the other is for wire entrance.

ASSURED PERFORMANCE

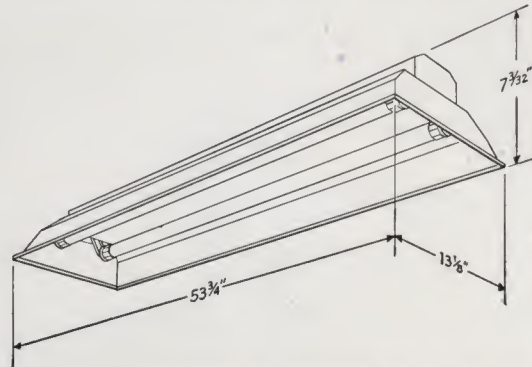
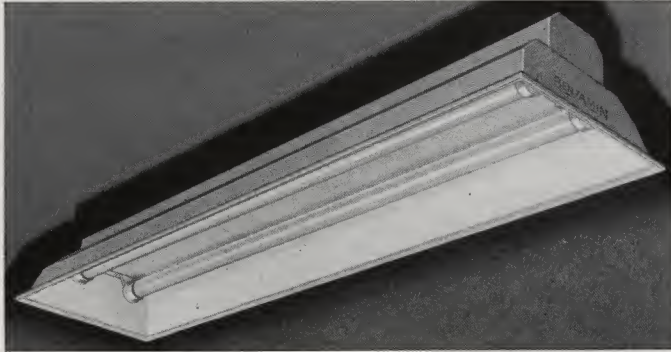
Certified Auxiliary Control Equipment—Auxiliary control equipment is certified by the Electrical Testing Laboratories and by the manufacturer to be equivalent to the latest issue of the specifications for fluorescent lamp auxiliaries sponsored by the manufacturers of Mazda Fluorescent lamps, or to be in accordance with the Federal Specifications for Fluorescent Lamp Auxiliaries WL-131 and supplements.

Guarantee—Benjamin lighting units, when properly installed and under normal conditions of use, are guaranteed against mechanical and electrical defects for a period of one year from date of delivery to the purchaser with the exception of the lamp starters for which the guarantee is limited to a period of 90 days. Correction of such defects by repair or replacement of material only shall constitute fulfillment of all obligations under this guarantee by the Benjamin Company.

Two-Lamp RLM "TX-40" Units

One-Piece Porcelain Enameled Units
For Two 40-Watt (48-inch) Fluorescent Lamps

Listed by Underwriters' Laboratories, Inc.



Dimensions for Two-Lamp RLM "TX-40" Units

WITH CONVENTIONAL BALLASTS AND STANDARD (FS-4) LAMP STARTERS

Wired Units with 6-inch Leads

Line Voltage†	Control Equipment	Shipping Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycles*	1 Twin Lamp Ballast—95% Power Factor	40	49262	\$39.00
220-250 Volts, 60 Cycles*	1 Twin Lamp Ballast—95% Power Factor	40	49282	39.00

WITH CONVENTIONAL BALLASTS AND MANUAL RESET, NON-BLINKING (FS-40) LAMP STARTERS‡

Wired Units with 6-inch Leads

Line Voltage†	Control Equipment	Shipping Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycles*	1 Twin Lamp Ballast—95% Power Factor	40	49262-W	\$40.40
220-250 Volts, 60 Cycles*	1 Twin Lamp Ballast—95% Power Factor	40	49282-W	40.40

WITH INSTANT-STARTING BALLAST. NO LAMP STARTERS REQUIRED

Wired Units with 6-inch Leads

Line Voltage†	Control Equipment	Shipping Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycles	1 Twin Lamp Ballast—95% Power Factor	43	49292	\$46.70

"SPRINGLOX" LAMPHOLDERS FOR REPLACEMENT

Number of Lamps	Type of Ballast	Lamp Spacing In Inches	Push End		Solid End	
			Cat. No.	List Price	Cat. No.	List Price
Two	Conventional	5	4042	\$3.00	4052	\$2.80
Two	Instant-Starting	5	4062	2.70	4072	2.40

* 50 cycle ballast units supplied when specified at prices quoted upon application.

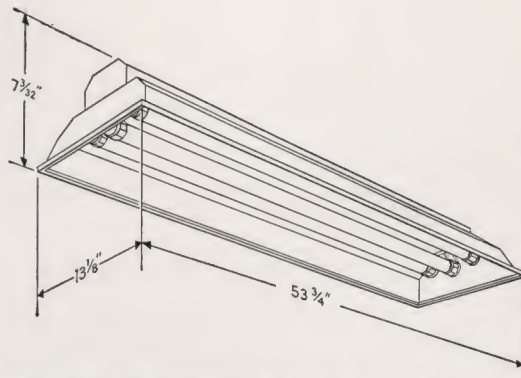
† Units supplied on special order with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional ballast prices.

‡ Automatic reset, non-blinking (FS-4NA) Starters can be supplied in place of (FS-40) Starters, if specified, at same unit list price. To order, suffix Cat. Nos. ending in W with A.
Lamps are not supplied.

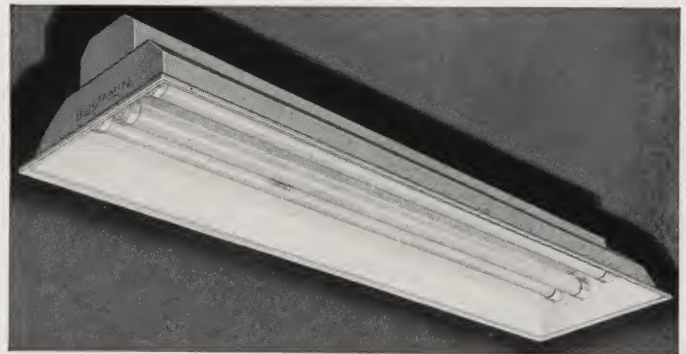
Three-Lamp RLM "TX-40" Units

One-Piece Porcelain Enameled Units
For Three 40-Watt (48-inch) Fluorescent Lamps

Listed by Underwriters' Laboratories, Inc.



Dimensions for Three-Lamp RLM "TX-40" Units



WITH CONVENTIONAL BALLASTS AND STANDARD (FS-4) LAMP STARTERS Wired Units with 6-inch Leads

Line Voltage†	Control Equipment	Shipping Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycles*	1 Triple Lamp Ballast—95% Power Factor	43	49263	\$49.00
220-250 Volts, 60 Cycles*	1 Triple Lamp Ballast—95% Power Factor	43	49283	48 00

WITH CONVENTIONAL BALLASTS AND MANUAL RESET, NON-BLINKING (FS-40) LAMP STARTERS‡ Wired Units with 6-inch Leads

Line Voltage†	Control Equipment	Shipping Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycles*	1 Triple Lamp Ballast—95% Power Factor	43	49263-W	\$51.10
220-250 Volts, 60 Cycles*	1 Triple Lamp Ballast—95% Power Factor	43	49283-W	50 10

"SPRINGLOX" LAMPHOLDERS FOR REPLACEMENT

Number of Lamps	Type of Ballast	Lamp Spacing In Inches	Push End		Solid End	
			Cat. No.	List Price	Cat. No.	List Price
Three	Conventional	2 1/2	4043	\$4.20	4053	\$3.80

* 50 cycle ballast units supplied when specified at prices quoted upon application.

† Units supplied on special order with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional ballast prices.

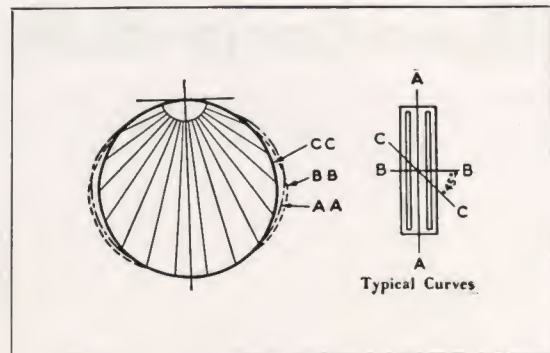
‡ Automatic reset, non-blinking (FS-4NA) Starters can be supplied in place of (FS-40) Starters, if specified, at same unit list price. To order, suffix Cat. Nos. ending in W with A. Lamps are not supplied.

Lighting Data

on Two and Three-Lamp Type "TX-40" Units

Tables below are based on 40-watt (48-inch) 3500° "white" Mazda Fluorescent Lamps, 2300 lumens. (For 4500° "white" lamps, 2100 lumens, multiply values by .91. For 6500° "daylight" lamps, 1920 lumens, multiply values by .835). Mounting heights are distance above floor: foot-candle values are on working plane 30 inches above floor.

Values are based on a minimum installation of 4 units and a maintenance factor of .75.



RLM Type "TX-40" With 2 "White" Fluorescent Lamps of 2300 Lumens Each

Approximate Spacing	Mounting height above floor	Area Per Unit	Room† Conditions	ROOM PROPORTIONS** Average Footcandles on Horizontal		
				FAVORABLE	AVERAGE	UNFAVORABLE
7'x 7'	7'-6" to 9'-6"	49 Sq. Feet	very light	49-53	45-48	32-36
			fairly light	48-49	39-45	26-32
			fairly dark	46-48	35-39	24-26*
8'x 8'	8'-0" to 10'-6"	64 Sq. Feet	very light	37-39	34-37	24-27
			fairly light	36-37	31-34	19.7-24
			fairly dark	35-36	27-31	18.6-19.7*
9'x 9'	8'-6" to 11'-6"	81 Sq. Feet	very light	30-32	26-30	19.0-22
			fairly light	28-30	24-26	15.3-19.0
			fairly dark	27-28	21-24	14.5-15.3*
10'x10'	9'-6" to 12'-6"	100 Sq. Feet	very light	24-25	22-24	15.3-17.6
			fairly light	23-24	19.3-22	12.7-15.3
			fairly dark	22-23	17.2-19.3	11.7-12.7*
11'x11'	10'-0" to 13'-6"	121 Sq. Feet	very light	19.9-21	18.0-19.6	12.7-14.6
			fairly light	19.4-19.9	16.0-18.0	10.5-12.7
			fairly dark	18.5-19.4	14.2-16.0	10.1-10.5*
12'x12'	10'-6" to 14'-6"	144 Sq. Feet	very light	16.8-17.7	15.1-16.5	10.9-12.6
			fairly light	16.2-16.8	13.4-15.1	9.6-10.9
			fairly dark	15.6-16.2	11.9-13.4	8.4- 9.6*

RLM Type "TX-40" With 3 "White" Fluorescent Lamps of 2300 Lumens Each

Approximate Spacing	Mounting height above floor	Area Per Unit	Room† Conditions	ROOM PROPORTIONS** Average Footcandles on Horizontal		
				FAVORABLE	AVERAGE	UNFAVORABLE
7'x 7'	7'-6" to 9'-6"	49 Sq. Feet	very light	67-71	60-65	45-53
			fairly light	66-67	54-60	39-45
			fairly dark	62-66	48-54	35-39*
8'x 8'	8'-0" to 10'-6"	64 Sq. Feet	very light	51-55	47-49	35-39
			fairly light	50-51	42-47	30-35
			fairly dark	48-50	37-42	26-30*
9'x 9'	8'-6" to 11'-6"	81 Sq. Feet	very light	41-43	37-39	27-32
			fairly light	39-41	33-37	24-27
			fairly dark	38-39	30-33	21-24*
10'x10'	9'-6" to 12'-6"	100 Sq. Feet	very light	33-35	30-32	22-25
			fairly light	32-33	26-30	19.2-22
			fairly dark	31-32	24-26	17.1-19.2*
11'x11'	10'-0" to 13'-6"	121 Sq. Feet	very light	27-28	24-26	18.4-21
			fairly light	26-27	22-24	15.9-18.4
			fairly dark	25-26	19.5-22	14.1-15.9*
12'x12'	10'-6" to 14'-6"	144 Sq. Feet	very light	23-24	21-22	15.4-17.7
			fairly light	22-23	18.4-21	13.4-15.4
			fairly dark	21-22	16.4-18.4	11.8-13.4*
13'6"x13'6"	11'-6" to 16'-0"	182 Sq. Feet	very light	18.1-19.2	16.3-17.4	12.0-14.0
			fairly light	17.6-18.1	14.6-16.3	10.5-12.0
			fairly dark	16.9-17.6	13.0-14.6	9.4-10.5*
15'x15'	12'-6" to 17'-6"	225 Sq. Feet	very light	14.7-15.6	13.3-14.1	9.9-11.5
			fairly light	14.2-14.7	11.8-13.3	8.5- 9.9
			fairly dark	13.6-14.2	10.5-11.8	7.6- 8.5*

* IMPRACTICAL—It is recommended that interior room conditions be improved or provision made for more frequent maintenance.

† Minimum heights shown are for spacing ratio of 1½ to 1. The greater heights are for 1 to 1 spacing.

‡ ROOM CONDITIONS—To determine condition of walls and ceilings consult Section I, General Catalog.

** ROOM PROPORTIONS—Use "Favorable" for broad rooms where width is about four times mounting height above floor.

Use "Average" where room width is about twice the mounting height above floor.

Use "Unfavorable" for narrow rooms where width is about equal to mounting height above floor.

Type II-G "Sealed-Flo 40" Dust-Tight Units

Porcelain Enameled, One-Piece Unit with Glass Cover —
Listed by Underwriters' Laboratories, Inc.



Two-Lamp Type II-G "Sealed-Flo 40" Unit showing cover and clamps

Listed by Underwriters' Laboratories, Inc., for
Class II (Groups F and G) • Class III • Class IV
Hazardous Locations

This improved line of enclosed Type II-G Dust-Tight Units incorporates all the advantages of the previous design plus a number of noteworthy improvements such as the new Benjamin "Springlox" lampholders; a new hinged cover which is opened by releasing just three clamps; and the attachment of all control equipment and wiring directly to the inside top of the housing.

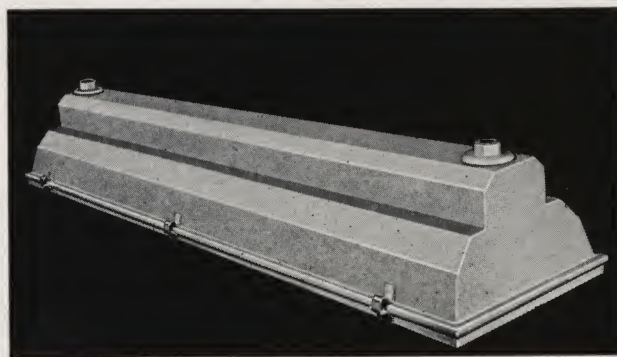
Type II-G "Sealed-Flo 40" Units are highest quality fluorescent lighting equipment for locations requiring dust or vapor-tight lighting equipment. They satisfy all Underwriters' requirements for installation in Class II, Group F hazardous locations (atmospheres containing carbon black, coal or coke dust); Class II, Group G locations (atmospheres containing grain dust, such as flour and feed mills, grain elevators, starch and sugar mills); Class III locations (such as some parts of cotton and textile mills, cotton gins, cotton seed mills and wood-working plants); Class IV locations (such as warehouses for cotton, cotton linters and waste, sisal, henequin, istle, jute, hemp, tow, cocoa fibre, oakum, baled waste, kapok, Spanish moss, excelsior, etc.)

For further information on hazardous locations see page 122 of Benjamin Catalog.

One-Piece Construction—In humid or dusty locations, this type of unit has a definite advantage over the conventional two-piece unit because there are no openings in which condensed water vapor can accumulate and cause rusting of the one-piece housing. In addition, the control equipment is fully protected from seepage and dust.

Useful in Non-Hazardous Locations—Since these units are vapor-tight, they are suitable for use where dampness, water vapor and other non-combustible vapors are present. Here, the enclosed, sealed construction protects lamps and reflecting surfaces from dirt accumulations.

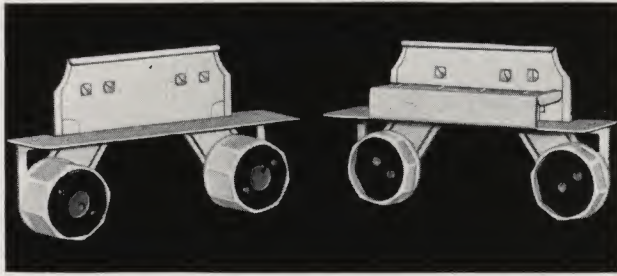
In addition, these units, when equipped with impact-resisting, tempered plate glass covers, are valuable in food industries, where there is danger of spoilage by glass fragments from broken lamps or ordinary glass covers.



Top view of Type II-G "Sealed-Flo 40" Unit showing one-piece construction, mounting flanges and spring bronze hinges.

Features and Lighting Data

For Improved Type II-G "Sealed-Flo 40" Units



Exclusive Benjamin, one-piece, metal-clad safety type lampholder assembly regularly supplied with Type II-G "Sealed-Flo 40" Units. (Left) Flexible spring base end of two-lamp "Springlox" assembly. (Right) Solid base end of two-lamp "Springlox" assembly.

FEATURES

Sealed Interior—Unit housings are of one-piece, porcelain enameled steel construction with the bottom effectively sealed by a hinged, asbestos gasketed glass cover. Two flanges on the top of the housing provide for conduit suspension and passage of lead wires into the housing without danger of seepage or entrance of dust into the housing.

"SPRINGLOX" Lampholders—Lamping and relamping units is made simple by the use of exclusive Benjamin "SPRINGLOX" lampholders. One end of the lamp is inserted into the lampholder with the spring base. This allows sufficient clearance for the pins on the opposite end of the lamp to slip into the facing solid base lampholder. Pressure of the lifetime spring securely locks the lamp in position.

New Hinged Cover—Besides providing a dust-tight and vapor-tight seal, this new cover is designed to open and close easily with one-hand operation. Three hinges keep the

cover perfectly aligned at all times while three spring-type, hand-operated clamps operate quickly and easily to speed maintenance.

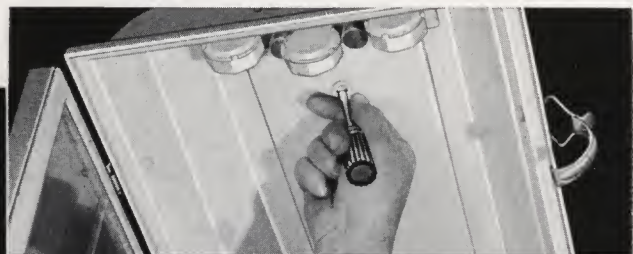
Easy to Install—Units are shipped assembled. Before installation, the inner porcelain enameled reflector plate, which is attached to brackets in the housing by two screws, is removed. This exposes the control equipment for quick, easy wiring. After the unit is suspended and wiring connections completed, the reflector plate is replaced and lamps and starters are inserted.

LIGHTING DATA

These units are available in arrangements for either two or three 48-inch, 40-watt fluorescent lamps. In general lighting installations, two-lamp "Sealed-Flo 40" units provide lighting levels ranging from 17 to 46 footcandles and three-lamp units from 22 to 57 footcandles at normal mounting and spacing.

Type II-G "Sealed-Flo 40" units can also be used for local lighting of inspection tables, production lines and machines. Mounted 30 to 36 inches above the surface to be lighted and equipped with "white" lamps, the two-lamp unit can provide lighting levels up to 94 footcandles and the three-lamp unit up to 125 footcandles.

Light Output—The design of the reflector, high reflection factor (exceeding 82%) of the porcelain enamel and other factors combine to give an efficiency of 67% or more of the output of the lamps for twin-lamp units and 61% or more for triple-lamp units. All units have a 16-degree shielding angle.



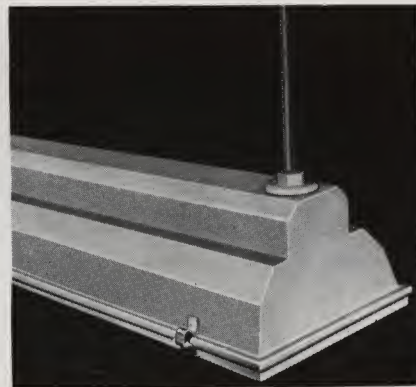
Loosening two screws allows the porcelain enameled reflector plate to be quickly detached. Wiring, ballast and lampholders are then exposed for easy checking.



Lamp insertion is quick, easy, positive. No danger of lamp vibrating loose from the "Springlox" lamp holder.



Three hand operated, spring-type clamps hold cover, under tension, against the reflector rim—assuring a tight seal.



Two cast iron, threaded, dust and vapor-tight suspension flanges are provided for attachment of rigid conduit stems.

SPECIFICATIONS

One-piece Reflector-Housing—Reflector-housing is of welded steel construction finished in enduring porcelain enamel. The top of the reflector is formed by a porcelain enameled steel plate, which is removed for access to the control equipment (mounted on the inside top of the reflector-housing) by loosening two screws.

Cover—The cadmium plated, steel cover frame is hinged to one side of the housing by three spring bronze hinges which hold the cover, under tension, against the housing. Three hand operated, quick-acting, spring-type "C"-shaped clamps support the other side of the cover. Hinges and clamps are designed to keep the cover perfectly aligned at all times. The special "U" shaped, wire-reinforced, woven asbestos gasket and glass are held firmly in the frame by twelve specially designed metal clips.

A choice is offered of either Double-Strength, Grade "A" Clear Glass or Impact-Resisting, Tempered Plate, Clear Glass Covers. This tempered plate glass is not affected by temperature extremes and fractures only under intense mechanical strains.

Spacing of Lamps—On two-lamp units "SPRINGLOX" lampholders space lamps on 5-inch centers. On three-lamp units the outer lamps are spaced on 5-inch centers and the third lamp is centered between and slightly below the two outer lamps.

Ballasts and Starters—Two and three-lamp units are listed with conventional type, high power factor ballasts. Two-lamp units are also available with two-lamp, high power factor, instant-starting ballasts. On units with conventional type ballasts, either a non-blinking type or a standard type starter is supplied for each lamp. All starters are easily removed for inspection or replacement.

Flicker—All ballasts operate the lamps out of phase to minimize cyclic light flicker.

Power Consumption—Twin-lamp units with lamps and conventional type ballasts use approximately 100 watts; with instant-starting type ballasts and lamps, approximately 110 watts. Three-lamp units with lamps and conventional type ballasts use approximately 150 watts.

Wiring—All units are wired and have 6-inch leads.

Provision for Grounding—Metal to metal bonds ground unit through conduit system.

Finish—Housing is finished in gray porcelain enamel outside; reflecting surfaces are a special diffusing white. Suspension flanges and cover frame are finished in baked enamel over cadmium plate. All other metal fittings are cadmium plated. Lampholders are finished in white enamel over cadmium plate.

MOUNTING

Units have two cast iron suspension flanges with conduit stops spaced on 47½-inch centers, tapped ½-inch iron pipe size; ¾-inch, if specified. One is for a dummy conduit stem and the other is for wire entrance.

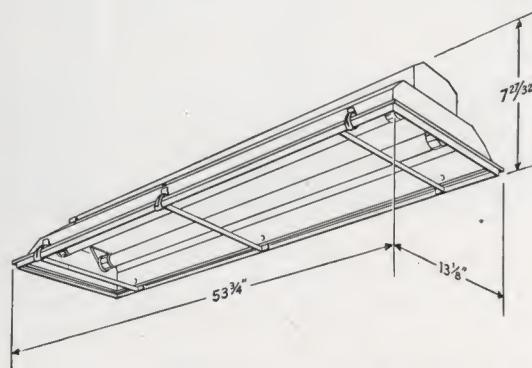
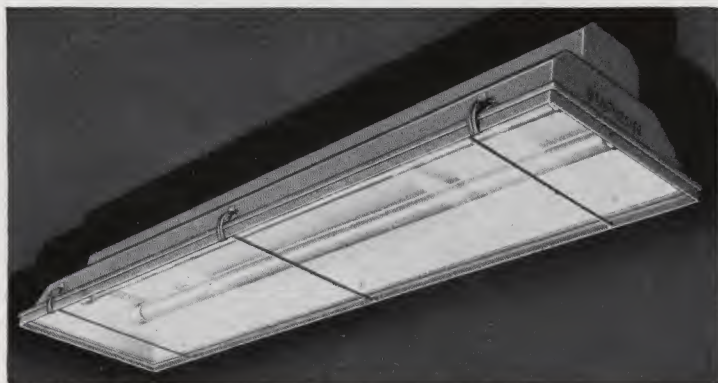
ASSURED PERFORMANCE

Certified Auxiliary Control Equipment—Auxiliary control equipment is certified by the Electrical Testing Laboratories and by the manufacturer to be equivalent to the latest issue of the specifications for fluorescent lamp auxiliaries sponsored by the manufacturers of Mazda Fluorescent lamps, or to be in accordance with the Federal Specifications for Fluorescent Lamp Auxiliaries WL-131 and supplements.

Guarantee—Benjamin lighting units, when properly installed and under normal conditions of use, are guaranteed against mechanical and electrical defects for a period of one year from date of delivery to the purchaser with the exception of the lamp starters for which the guarantee is limited to a period of 90 days. Correction of such defects by repair or replacement of material only shall constitute fulfillment of all obligations under this guarantee by the Benjamin Company.

Two-Lamp Type II-G "Sealed-Flo 40" Units

One-Piece Porcelain Enameled, Dust-Tight Units For 40-Watt (48-inch) Lamps



Dimensions of Type II-G "Sealed-Flo 40"
Two-Lamp Unit

Listed by Underwriters' Laboratories, Inc.

WIRED UNITS WITH 6-INCH LEADS AND DOUBLE-STRENGTH GRADE "A" CLEAR GLASS COVERS With Conventional Ballasts and Manual Reset, Non-Blinking (FS-40) Starters‡

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23	49462-CLW	\$65.40
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23	49482-CLW	65.40

With Conventional Ballasts and Standard (FS-4) Starters

110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23	49462-CL	\$64.00
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23	49482-CL	64.00

With Instant-Starting Ballasts—No Lamp Starters Needed

110-125 Volts, 60 Cycle	1 Twin Lamp Ballast—95% Power Factor	26	49492-CL	\$71.70
-------------------------	--------------------------------------	----	----------	---------

WIRED UNITS WITH 6-INCH LEADS AND TEMPERED PLATE, CLEAR GLASS COVERS With Conventional Ballasts and Manual Reset, Non-Blinking (FS-40) Starters‡

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23½	49462-TPW	\$79.10
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23½	49482-TPW	79.10

With Conventional Ballasts and Standard (FS-4) Starters

110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23½	49462-TP	\$77.70
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	23½	49482-TP	77.70

With Instant-Starting Ballasts—No Lamp Starters Needed

110-125 Volts, 60 Cycle	1 Twin Lamp Ballast—95% Power Factor	26½	49492-TP	\$91.70
-------------------------	--------------------------------------	-----	----------	---------

COVER GLASS FOR REPLACEMENT

Description	Cat. No.	List Price
Tempered plate, clear glass with asbestos gasket and metal clips	8435	\$25.70
Double-strength, grade "A" clear glass with asbestos gasket and metal clips	8434	12.00

* 50 cycle ballast units supplied when specified at prices quoted upon application.

† Units supplied on special order with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional type ballast prices.

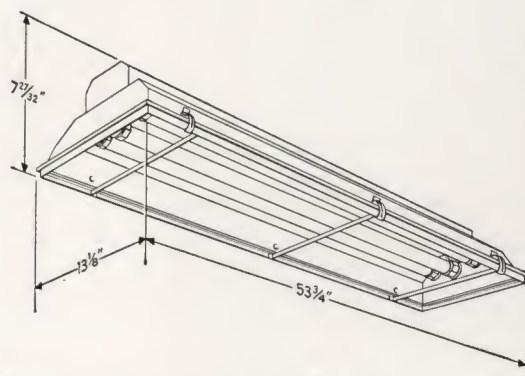
‡ Automatic reset, non-blinking (FS-4NA) Starters can be supplied in place

of (FS-40) Starters, if specified, at same unit list price. To order, suffix Cat. Nos. ending in W with A.

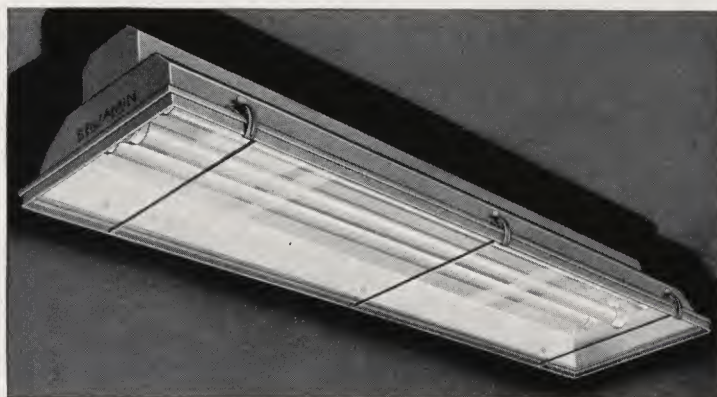
Wire-Reinforced Glass Covers—Units with wire-reinforced glass covers are available upon application. Lamps are not supplied.

Three-Lamp Type II-G "Sealed-Flo 40" Units

One-Piece Porcelain Enameled, Dust-Tight Units For 40-Watt (48-inch) Lamps



Dimensions of Type II-G "Sealed-Flo 40"
Three-Lamp Unit



Listed by Underwriters' Laboratories, Inc.

WIRED UNITS WITH 6-INCH LEADS AND DOUBLE-STRENGTH GRADE "A" CLEAR GLASS COVERS With Conventional Ballasts and Manual Reset, Non-Blinking (FS-40) Starters†

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30	49463-CLW	\$76.10
220-250 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30	49483-CLW	75.10

With Conventional Ballasts and Standard (FS-4) Starters

110-125 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30	49463-CL	\$74.00
220-250 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30	49483-CL	73.00

WIRED UNITS WITH 6-INCH LEADS AND TEMPERED PLATE, CLEAR GLASS COVERS With Conventional Ballasts and Manual Reset, Non-Blinking (FS-40) Starters†

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30½	49463-TPW	\$89.80
220-250 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30½	49483-TPW	88.80

With Conventional Ballasts and Standard (FS-4) Starters

110-125 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30½	49463-TP	\$87.70
220-250 Volts 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	30½	49483-TP	86.70

COVER GLASS FOR REPLACEMENT

Description	Cat. No.	List Price
Tempered plate, clear glass with asbestos gasket and metal clips	8435	\$25.70
Double-strength, grade "A" clear glass with asbestos gasket and metal clips	8434	12.00

* 50 cycle ballast units supplied when specified at prices quoted upon application.

† Units supplied on special order with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional type ballast prices.

‡ Automatic reset, non-blinking (FS-4NA) Starters can be supplied in place

of (FS-40) Starters, if specified, at same unit list price. To order, suffix Cat. Nos. ending in W with A.

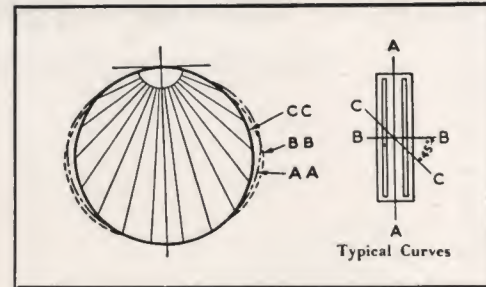
Wire-Reinforced Glass Covers—Units with wire-reinforced glass covers are available upon application. Lamps are not supplied.

Lighting Data

on Two and Three-Lamp "Sealed-Flo 40" Units

Tables below are based on 40 watt (48-inch) 3500° "white" Mazda Fluorescent Lamps, 2300 lumens. (For 4500° "white" lamps, 2100 lumens, multiply values by .91. For 6500° "daylight" lamps, 1920 lumens, multiply values by .835). Mounting heights are distance above floor; footcandle values are on working plane 30 inches above floor.

Values are based on a minimum installation of 4 units and a maintenance factor of .75.



Type II-G "Sealed-Flo 40" with Two White Fluorescent Lamps of 2300 Lumens Each

Approximate Spacing	†Mounting height above floor	Area per Unit	Room ‡ Conditions	ROOM PROPORTIONS**					
				Average Footcandles on Horizontal					
7'x 7'	7'-6" to 9'-6"	49 Sq. Feet	very light fairly light fairly dark	FAVORABLE	42-46	AVERAGE	39-41	UNFAVORABLE	27-30
					41-42		35-39		22-27
					39-41		30-35		21-22*
					32-34		29-32		21-23
8'x 8'	8'-0" to 10'-6"	64 Sq. Feet	very light fairly light fairly dark		31-32		26-29		17-21
					30-31		23-26		16-17*
					25-27		22-25		16-18
					24-25		21-22		13-16
9'x 9'	8'-6" to 11'-6"	81 Sq. Feet	very light fairly light fairly dark		23-24		18-21		12-13*
					21-22		19-20		13-15
					20-21		16-19		11-13
					19-20		14.5-16		10-11*
10'x10'	9'-6" to 12'-6"	100 Sq. Feet	very light fairly light fairly dark		17-18		15-16		11-12.5
					16-17		13.5-15		10-11
					15-16		12-13.5		8.5-10*
					14-15		13-14		9-11
11'x11'	10'-0" to 13'-6"	121 Sq. Feet	very light fairly light fairly dark		13.5-14		11.5-13		8- 9
					13-13.5		10-11.5		7- 8*

Type II-G "Sealed-Flo 40" with Three White Fluorescent Lamps of 2300 Lumens Each

7'x 7'	7'-6" to 9'-6"	49 Sq. Feet	very light fairly light fairly dark	FAVORABLE	54-59 52-54 50-52	AVERAGE	48-53 44-48 40-44	UNFAVORABLE	36-43 32-36 29-32*
8'x 8'	8'-0" to 10'-6"	64 Sq. Feet	very light fairly light fairly dark		42-44 41-42 40-41		38-41 34-38 31-34		29-32 24-29 21-24*
9'x 9'	8'-6" to 11'-6"	81 Sq. Feet	very light fairly light fairly dark		33-35 32-33 31-32		30-32 26-30 24-26		22-25 20-22 17-20*
10'x10'	9'-6" to 12'-6"	100 Sq. Feet	very light fairly light fairly dark		26-28 25-26 24-25		24-25 21-24 20-21		18-21 15.5-18 14-15.5*
11'x11'	10'-0" to 13'-6"	121 Sq. Feet	very light fairly light fairly dark		22-23 21-22 20-21		20-21 18-20 16-18		15-17 13-15 11.5-13*
12'x12'	10'-6" to 14'-6"	144 Sq. Feet	very light fairly light fairly dark		18-19 17-18 16-17		16-18 15-16 13-15		12.5-14.5 11-12.5 9.5-11*
13'-6"x13'-6"	11'-6" to 16'-0"	182 Sq. Feet	very light fairly light fairly dark		14.5-15.5 14-14.5 13.5-14		13-14 12-13 10.5-12		10-11.5 8.5-10 8- 8.5*
15'x15'	12'-6" to 17'-6"	225 Sq. Feet	very light fairly light fairly dark		12-12.5 11.5-12 11-11.5		10-11.5 9.5-10 8.5- 9.5		8- 9 7- 8 6- 7*

* IMPRACTICAL—It is recommended that interior room conditions be improved or provision made for more frequent maintenance.

† Minimum heights shown are for spacing ratio of 1½ to 1. The greater heights are for 1 to 1 spacing.

‡ ROOM CONDITIONS—To determine condition of walls and ceilings consult Section I, General Catalog.

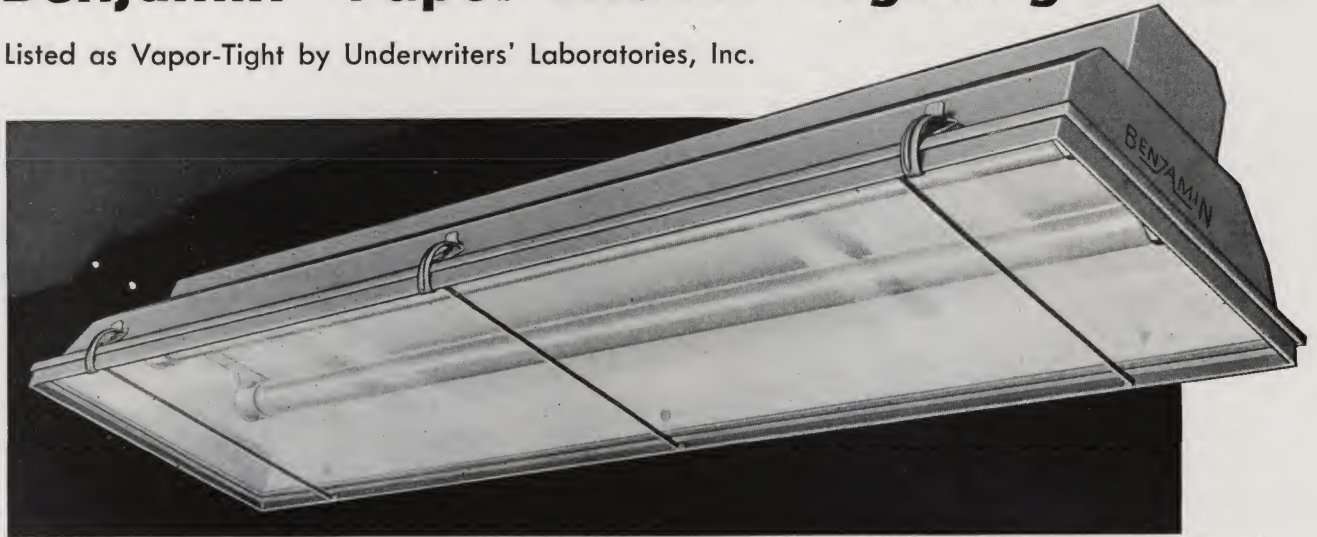
** ROOM PROPORTIONS—Use "Favorable" for broad rooms where width is about four times mounting height above floor.

Use "Average" where room width is about twice the mounting height above floor.

Use "Unfavorable" for narrow rooms where width is about equal to mounting height above floor.

Benjamin "Vapor-Tite 40" Lighting Units

Listed as Vapor-Tight by Underwriters' Laboratories, Inc.



Cat. No. 49562

These new Benjamin "Vapor-Tite 40" Units are ideal for lighting meat packing plants, bottling plants, laundries or any location which has excessive amounts of noncombustible vapors or dust present in the atmosphere.

Sealed, One-Piece Porcelain Enameled Housing—Provides a long-lasting, easily maintained, vapor-tight enclosure for ballasts, wiring and lamps. Threaded, suspension flanges provide vapor-tight joint between conduit stems and housing.

Hinged Glass Cover—Three hand-operated, spring type clamps unsnap to allow cover to swing down and back on the three spring bronze hinges which keep cover perfectly aligned at all times. An extruded, rubber gasket provides a vapor-tight seal between housing and cover.

"Springlox" Lampholders—An exclusive, Benjamin maintenance and safety feature that cuts relamping time to a few seconds. Lamps are inserted by pushing one end into

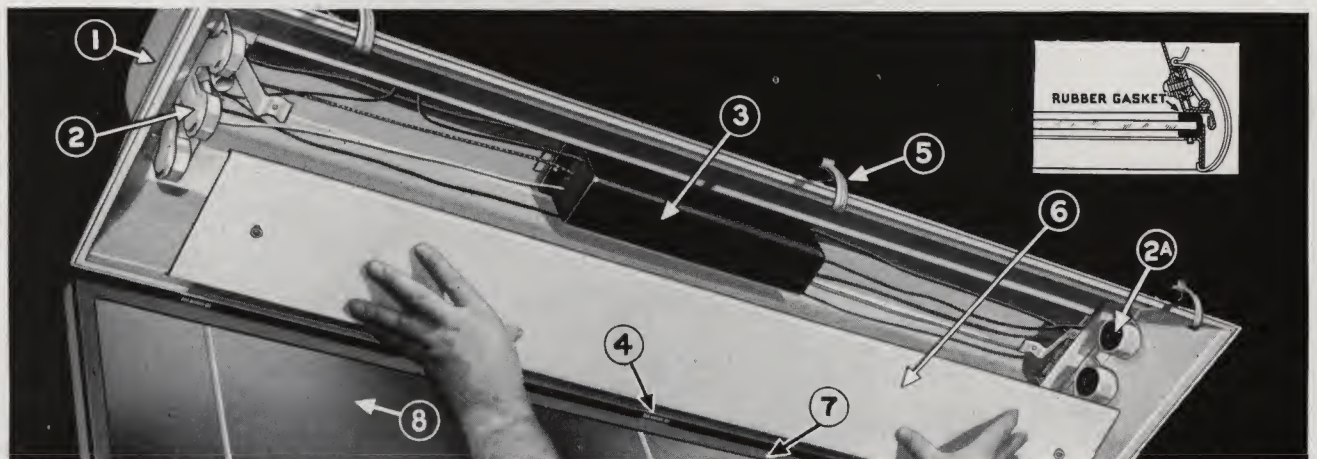
the flexible, spring-base part of the lampholder which allows the other end of the lamp to slip into place in the facing solid-base part of the "Springlox" lampholder assembly. "Springlox" locks lamps in position and provides positive assurance that they will not vibrate loose.

Control Equipment Easily Accessible—Wiring and control equipment are attached to the inside of the top of the housing and are covered by a porcelain enameled plate which is easily removed by loosening two screws.

LIGHTING DATA

These units are available in arrangements for either two or three 48-inch, 40-watt fluorescent lamps.

Light Output—The design of the reflector, high reflection factor (exceeding 82%) of the porcelain enamel and other factors combine to give an efficiency of 67% or more of the output of the lamps for twin-lamp units and 61% or more for triple-lamp units. All units have a 16-degree shield-angle.



1—One-piece, porcelain enameled steel housing. 2—Solid base part of three-lamp "Springlox" Lampholder Assembly. 2A—Flexible, spring base part of "Springlox". 3—Three-lamp ballast, 95% power factor.

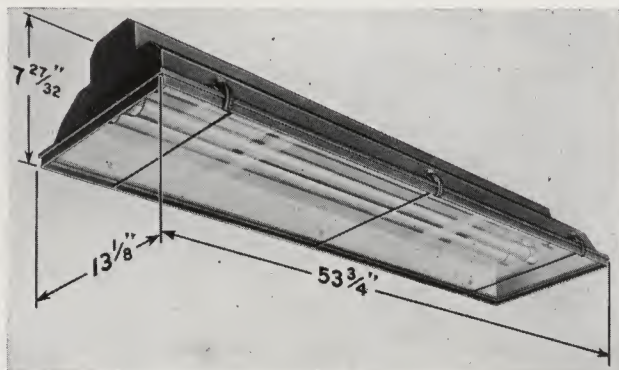
4—Spring bronze hinge. 5—Hand-operated, spring type clamp. 6—Porcelain enameled steel reflector plate. 7—Extruded rubber gasket. 8—Cover glass.

(Issued August 8, 1949)

BENJAMIN • page 447

Benjamin "Vapor-Tite 40" Lighting Units

Specifications for Two and Three-Lamp, 40-Watt, Enclosed, Porcelain Enameled Units



One-piece Reflector-Housing—Welded steel construction finished in enduring porcelain enamel. The top of the reflector is formed by a porcelain enameled steel plate which is removed for access to the control equipment (mounted on the inside top of the reflector-housing) by loosening two screws.

Cover—The steel cover frame is hinged to one side of the

housing by three spring bronze hinges which hold the cover, under tension, against the housing. Three hand operated, quick-acting, spring-type clamps support the other side of the cover. The special "U" shaped, extruded rubber gasket and the glass are held firmly in the frame by twelve specially designed metal clips. Two kinds of cover glass are available: double-strength, grade "A" clear glass or impact-resisting tempered plate clear glass.

Wiring—All units are wired and have 6-inch leads.

Finish—Housing is finished in gray porcelain enamel outside; reflecting surfaces are a special diffusing white. Suspension flanges and cover frame are finished in baked enamel over cadmium plate. All other metal fittings are cadmium plated.

Mounting—Units have two threaded, cast iron suspension flanges spaced on 47 1/2-inch centers, tapped 1/2-inch iron pipe size; 3/4-inch, if specified. One is for a dummy conduit stem and the other is for wire entrance.

Additional Specifications—Please refer to specifications on page 438A-1 for additional information.

WIRED, TWO-LAMP UNITS

With Conventional Ballasts (95 % P.F.) and Manual Reset, Nonblinking (FS-40) Starters†

Line Voltage† 60 Cycle*	With Double-Strength, Grade A Clear Glass Cover			With Tempered Plate, Clear Glass Cover		
	Net Wt. Lbs. Ea.	Cat. No.	List Price	Net Wt. Lbs. Ea.	Cat. No.	List Price
110-125V.	23	49562-CLW	\$61.40	23 1/2	49562-TPW	\$75.10
220-250V.	23	49582-CLW	61.40	23 1/2	49582-TPW	75.10

With Conventional Ballasts (95 % P.F.) and Standard (FS-4) Starters

110-125V.	23	49562-CL	\$60.00	23 1/2	49562-TP	\$73.70
220-250V.	23	49582-CL	60.00	23 1/2	49582-TP	73.70

With Instant Starting Ballasts (95 % P.F.) — No Lamp Starters Needed

110-125V.	26	49592-CL	\$66.20	26 1/2	49592-TP	\$79.90
-----------	----	----------	---------	--------	----------	---------

WIRED, THREE-LAMP UNITS

With Conventional Ballasts (95 % P.F.) and Manual Reset, Nonblinking (FS-40) Starters†

Line Voltage† 60 Cycle*	With Double-Strength, Grade A Clear Glass Cover			With Tempered Plate, Clear Glass Cover		
	Net Wt. Lbs. Ea.	Cat. No.	List Price	Net Wt. Lbs. Ea.	Cat. No.	List Price
110-125V.	30	49563-CLW	\$72.10	30 1/2	49563-TPW	\$85.80
220-250V.	30	49583-CLW	71.10	30 1/2	49583-TPW	84.80

With Conventional Ballasts (95 % P.F.) and Standard (FS-4) Starters

110-125V.	30	49563-CL	\$70.00	30 1/2	49563-TP	\$83.70
220-250V.	30	49583-CL	69.00	30 1/2	49583-TP	82.70

* 50 cycle ballast units supplied at prices quoted upon application.

† Units supplied on special order with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional type ballast prices.

‡ Automatic reset, nonblinking (FS-4NA) starters can be supplied in place of (FS-40) starters, if specified, at the same list price. To order, suffix Cat. Nos. ending in W with A.

Wire-Reinforced Glass Covers—Available upon application.

Cover Glass for Replacement, Supplied Only as Follows—Clear Glass with rubber gasket and metal clips, Cat. No. 8415, list price \$8.00; tempered glass with rubber gasket and metal clips, Cat. No. 8416, list price \$21.70.

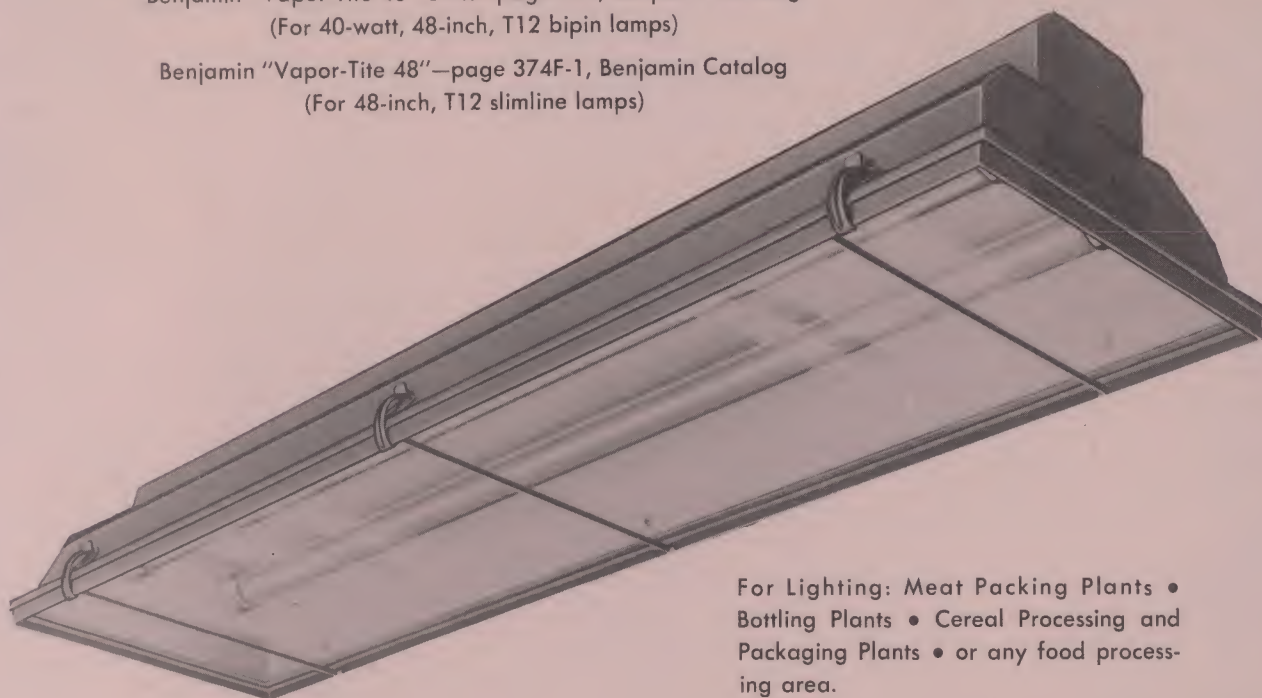
Lamps are not supplied.

Clear Plastic* Covers

FOR:

Benjamin "Vapor-Tite 40" Units—page 333, Benjamin Catalog
(For 40-watt, 48-inch, T12 bipin lamps)

Benjamin "Vapor-Tite 48"—page 374F-1, Benjamin Catalog
(For 48-inch, T12 slimline lamps)

No. P-4

For Lighting: Meat Packing Plants •
Bottling Plants • Cereal Processing and
Packaging Plants • or any food process-
ing area.

Clear plastic* covers are now available for the fluorescent lighting units listed above. The clear plastic is $\frac{1}{8}$ -inch thick and practically unbreakable. It provides a sure way of keeping broken lamp fragments out of vats, sorting tables, etc. where they would cause expensive contamination of food products.

The lighting units are approved as vapor-tight by Underwriters Laboratories and are ideal for excessively humid locations.

TO SPECIFY: Substitute suffix "PG" for suffix "TP" on Cat. Nos. for units with Tempered Plate glass covers. List price is the same as for units with Tempered Plate glass.

*Methyl Methacrylate—Lucite or Plexiglass

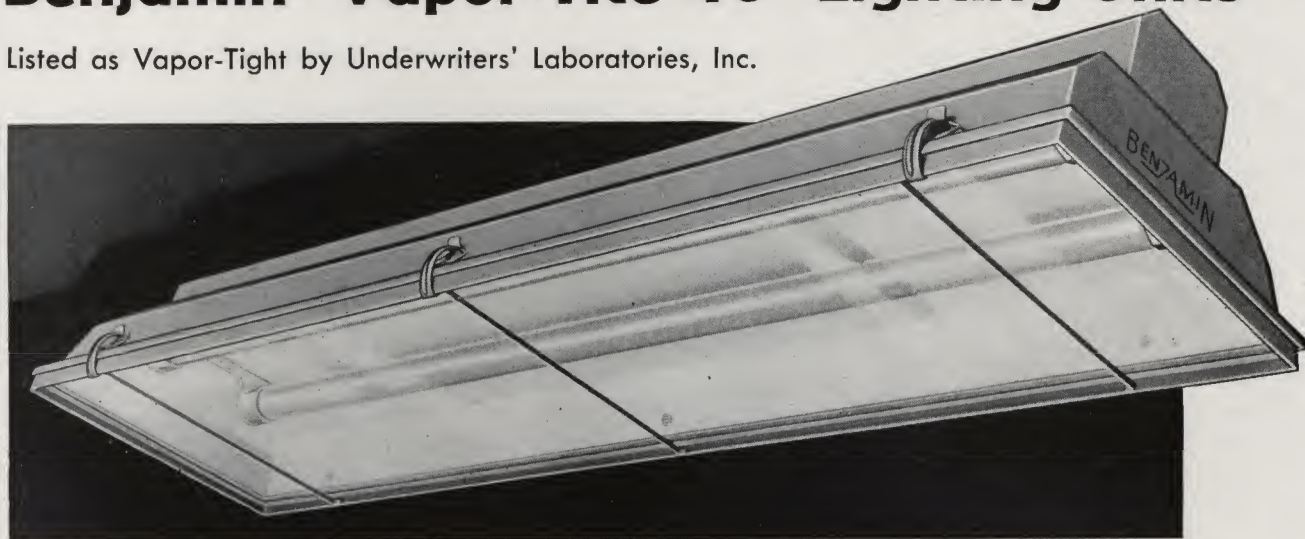
(Issued April 9, 1951)

File next to page 334
Benjamin General Catalog

BENJAMIN ELECTRIC MFG. COMPANY • Des Plaines, Illinois

Benjamin "Vapor-Tite 40" Lighting Units

Listed as Vapor-Tight by Underwriters' Laboratories, Inc.



Cat. No. 49562

These new Benjamin "Vapor-Tite 40" Units are ideal for lighting meat packing plants, bottling plants, laundries or any location which has excessive amounts of noncombustible vapors or dust present in the atmosphere.

Sealed, One-Piece Porcelain Enameled Housing—Provides a long-lasting, easily maintained, vapor-tight enclosure for ballasts, wiring and lamps. Threaded, suspension flanges provide vapor-tight joint between conduit stems and housing.

Hinged Glass Cover—Three hand-operated, spring type clamps unsnap to allow cover to swing down and back on the three spring bronze hinges which keep cover perfectly aligned at all times. An extruded, rubber gasket provides a vapor-tight seal between housing and cover.

"Springlox" Lampholders—An exclusive, Benjamin maintenance and safety feature that cuts relamping time to a few seconds. Lamps are inserted by pushing one end into

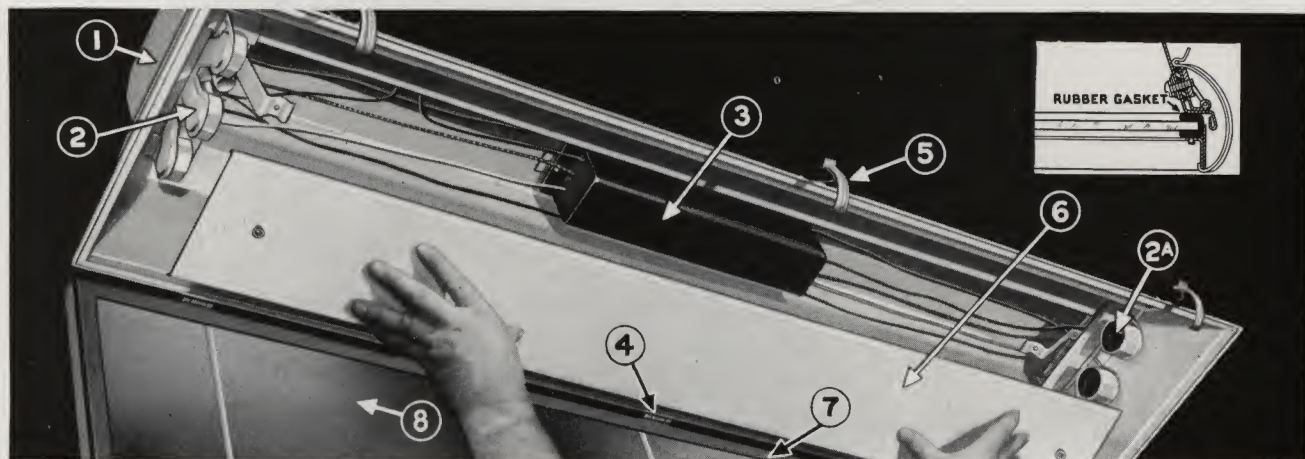
the flexible, spring-base part of the lampholder which allows the other end of the lamp to slip into place in the facing solid-base part of the "Springlox" lampholder assembly. "Springlox" locks lamps in position and provides positive assurance that they will not vibrate loose.

Control Equipment Easily Accessible—Wiring and control equipment are attached to the inside of the top of the housing and are covered by a porcelain enameled plate which is easily removed by loosening two screws.

LIGHTING DATA

These units are available in arrangements for either two or three 48-inch, 40-watt fluorescent lamps.

Light Output—The design of the reflector, high reflection factor (exceeding 82%) of the porcelain enamel and other factors combine to give an efficiency of 67% or more of the output of the lamps for twin-lamp units and 61% or more for triple-lamp units. All units have a 16-degree shielding angle.



1—One-piece, porcelain enameled steel housing. 2—Solid base part of three-lamp "Springlox" Lampholder Assembly. 2A—Flexible, spring base part of "Springlox". 3—Three-lamp ballast, 95% power factor.

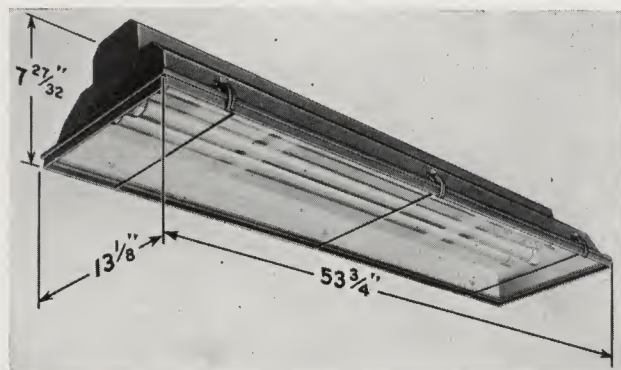
4—Spring bronze hinge. 5—Hand-operated, spring type clamp. 6—Porcelain enameled steel reflector plate. 7—Extruded rubber gasket. 8—Cover glass.

(Issued August 8, 1949)

BENJAMIN • page 447

Benjamin "Vapor-Tite 40" Lighting Units

Specifications for Two and Three-Lamp, 40-Watt, Enclosed, Porcelain Enameled Units



One-piece Reflector-Housing—Welded steel construction finished in enduring porcelain enamel. The top of the reflector is formed by a porcelain enameled steel plate which is removed for access to the control equipment (mounted on the inside top of the reflector-housing) by loosening two screws.

Cover—The steel cover frame is hinged to one side of the

housing by three spring bronze hinges which hold the cover, under tension, against the housing. Three hand operated, quick-acting, spring-type clamps support the other side of the cover. The special "U" shaped, extruded rubber gasket and the glass are held firmly in the frame by twelve specially designed metal clips. Two kinds of cover glass are available: double-strength, grade "A" clear glass or impact-resisting tempered plate clear glass.

Wiring—All units are wired and have 6-inch leads.

Finish—Housing is finished in gray porcelain enamel outside; reflecting surfaces are a special diffusing white. Suspension flanges and cover frame are finished in baked enamel over cadmium plate. All other metal fittings are cadmium plated.

Mounting—Units have two threaded, cast iron suspension flanges spaced on 47 1/2-inch centers, tapped 1/2-inch iron pipe size; 3/4-inch, if specified. One is for a dummy conduit stem and the other is for wire entrance.

Additional Specifications—Please refer to specifications on page 438A-1 for additional information.

WIRED, TWO-LAMP UNITS

With Conventional Ballasts (95 % P.F.) and Manual Reset, Nonblinking (FS-40) Starters†

Line Voltage† 60 Cycle*	With Double-Strength, Grade A Clear Glass Cover			With Tempered Plate, Clear Glass Cover		
	Net Wt. Lbs. Ea.	Cat. No.	List Price	Net Wt. Lbs. Ea.	Cat. No.	List Price
110-125V.	23	49562-CLW	\$61.40	23 1/2	49562-TPW	\$75.10
220-250V.	23	49582-CLW	61.40	23 1/2	49582-TPW	75.10

With Conventional Ballasts (95 % P.F.) and Standard (FS-4) Starters

110-125V.	23	49562-CL	\$60.00	23 1/2	49562-TP	\$73.70
220-250V.	23	49582-CL	60.00	23 1/2	49582-TP	73.70

With Instant Starting Ballasts (95 % P.F.) — No Lamp Starters Needed

110-125V.	26	49592-CL	\$66.20	26 1/2	49592-TP	\$79.90
-----------	----	----------	---------	--------	----------	---------

WIRED, THREE-LAMP UNITS

With Conventional Ballasts (95 % P.F.) and Manual Reset, Nonblinking (FS-40) Starters†

Line Voltage† 60 Cycle*	With Double-Strength, Grade A Clear Glass Cover			With Tempered Plate, Clear Glass Cover		
	Net Wt. Lbs. Ea.	Cat. No.	List Price	Net Wt. Lbs. Ea.	Cat. No.	List Price
110-125V.	30	49563-CLW	\$72.10	30 1/2	49563-TPW	\$85.80
220-250V.	30	49583-CLW	71.10	30 1/2	49583-TPW	84.80

With Conventional Ballasts (95 % P.F.) and Standard (FS-4) Starters

110-125V.	30	49563-CL	\$70.00	30 1/2	49563-TP	\$83.70
220-250V.	30	49583-CL	69.00	30 1/2	49583-TP	82.70

* 50 cycle ballast units supplied at prices quoted upon application.

† Units supplied on special order with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional type ballast prices.

‡ Automatic reset, nonblinking (FS-4NA) starters can be supplied in place of (FS-40) starters, if specified, at the same list price. To order, suffix Cat. Nos. ending in W with A.

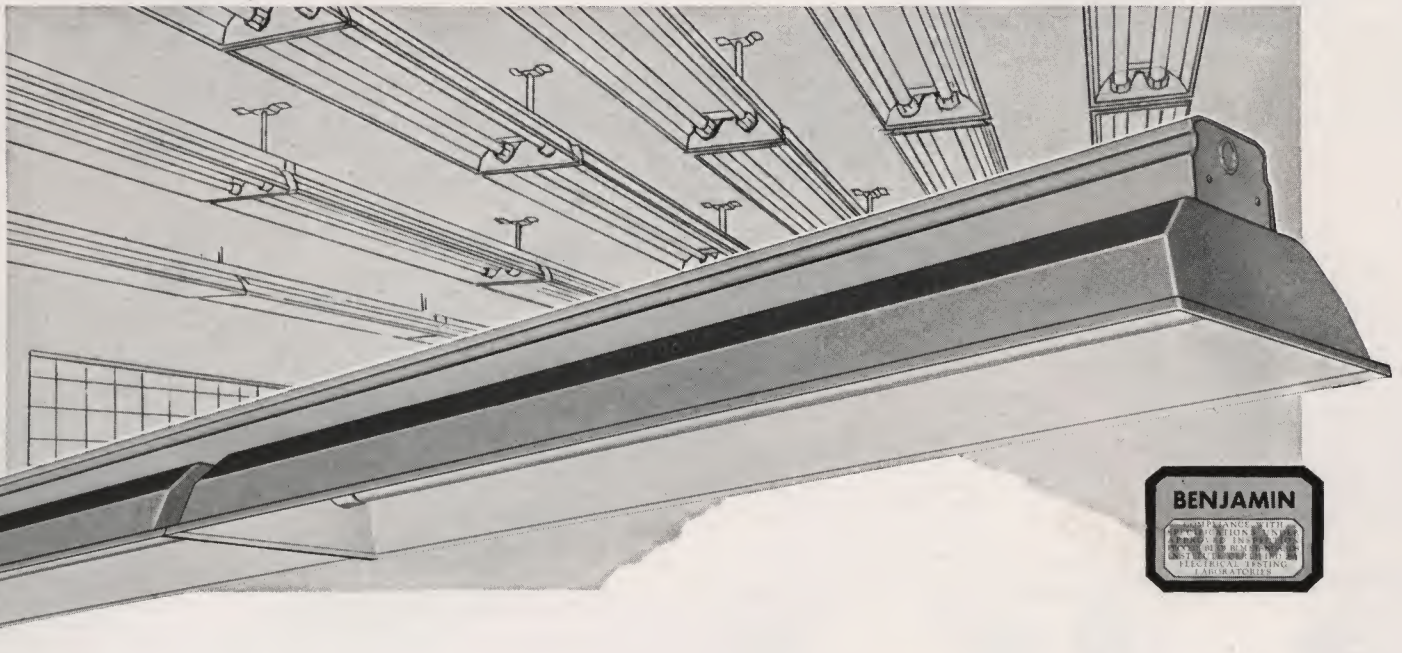
Wire-Reinforced Glass Covers—Available upon application.

Cover Glass for Replacement, Supplied Only as Follows—Clear Glass with rubber gasket and metal clips, Cat. No. 8415, list price \$8.00; tempered glass with rubber gasket and metal clips, Cat. No. 8416, list price \$21.70.

Lamps are not supplied.

Benjamin RLM "Lite Line 40" System

for continuous lines of fluorescent light



Benjamin "Lite-Line 40" Systems provide a most practical, economical and efficient method of obtaining the higher footcandle levels of illumination necessary to keep pace with the fast tempo of today's industrial production. The continuous lines of light, extending across the entire ceiling, make it possible to most effectively utilize the maximum amount of floor space and to obtain from 45 to 100 foot-candles of illumination on the working plane when installed at normal mounting and spacing.

The basis of "Lite-Line 40" Systems are double and single reflector channel sections with RLM porcelain enameled steel reflectors. These channel sections together with the reflectors, form a continuous wireway enclosure when joined end to end by means of a rigid channel coupling. As a greater part of the branch circuit wiring can be carried within this continuous wireway enclosure much of the usual expenditure for conduit, outlet boxes and fittings is eliminated, resulting in 25 to 40% savings in the cost of installation and wiring.

Another time and money saving feature is the complete line of sliding hanger type suspensions available for mounting the continuous lines of fluorescent light.

Following are a few highlights of the Benjamin "Lite-Line 40" construction:

- **Porcelain Enameled Steel Reflectors** — for durability, maximum light output, easy cleaning.
- **"SPRINGLOX" Metal-clad Lampholders** — speed lamping, prevent lamps dropping out, extremely rugged.
- **"LOK-LATCH" Fasteners** — speed reflector removal.

- **Rugged Channel Construction.**
- **Rigid Channel Couplings** — insure accurate alignment of lines.
- **Sliding Hanger Type Suspension Fittings.**
- **Smart Streamlined Styling.**
- **Conforms to all recognized illumination, electrical and mechanical standards as provided by the National Electrical Code and the RLM Standards Institute.**

AVAILABLE IN TYPE A OR E CONSTRUCTION

"Lite-Line 40" Systems are available in two reflector widths as explained below:

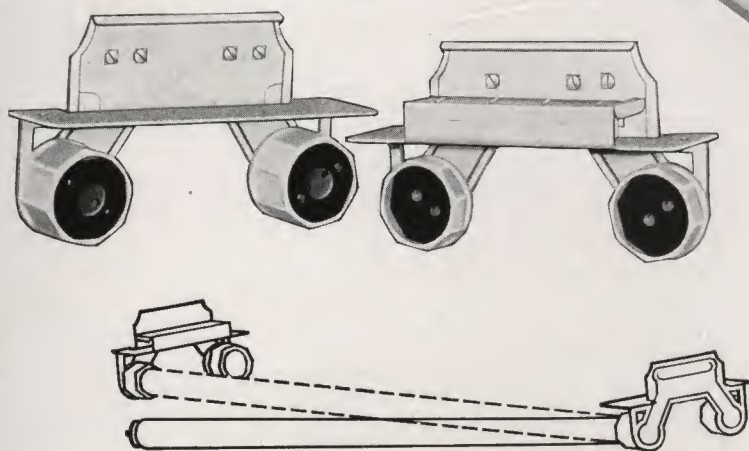
Type A "Lite-Line 40" System — Supplied with twin-lamp, open-end, porcelain enameled steel reflectors only. Reflectors are 50³/₄-inches long by 11¹/₂-inches wide. Lampholder assemblies space two 40 watt fluorescent lamps on 3¹/₂-inch centers.

Type E "Lite-Line 40" System — Supplied with either twin or triple-lamp, closed or open-end, porcelain enameled steel reflectors. Closed-end reflectors are 53³/₄-inches long by 13¹/₈-inches wide. Open-end reflectors are 53⁵/₈-inches long by 13¹/₈-inches wide. Lampholder assemblies in twin-lamp units space two 40 watt fluorescent lamps on 5-inch centers. Lampholder assemblies in triple-lamp units space three 40 watt fluorescent lamps on 2¹/₂-inch centers.

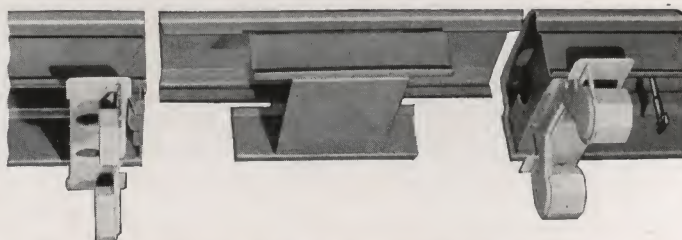
Type A and Type E "Lite-Line 40" Systems are not interchangeable, but Sliding Hanger Type Suspension Fittings and Channel End Caps are common to both lines.

Benjamin "Lite-Line 40" System

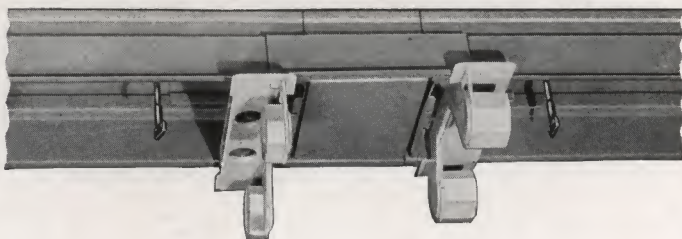
Exclusive Construction Features

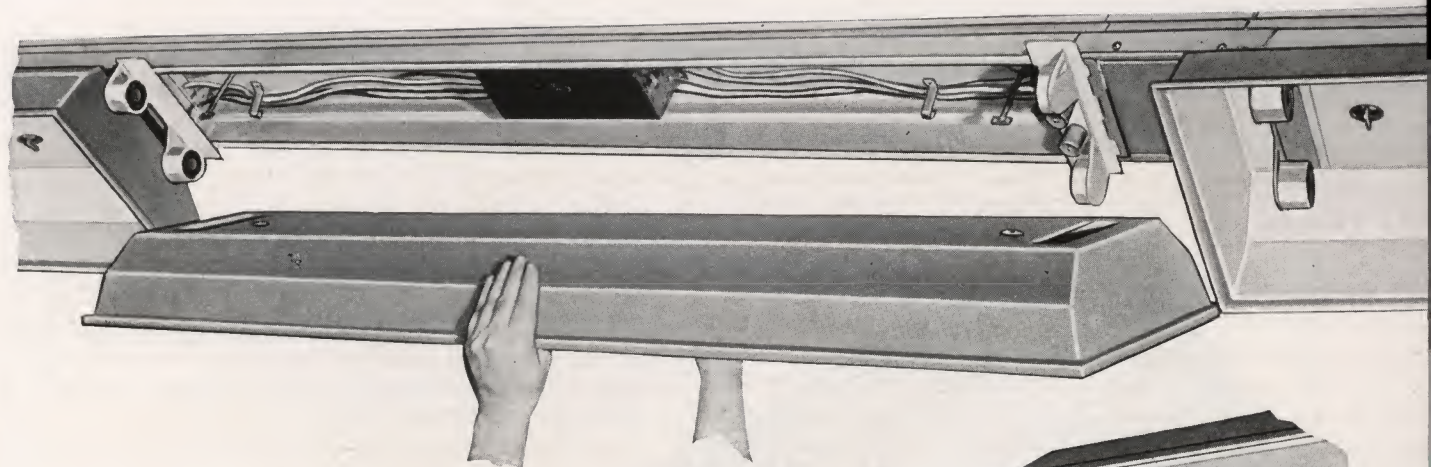


Exclusive Benjamin metal-clad "SPRINGLOX" lampholder assemblies simplify the insertion and removal of fluorescent lamps. In installing, simply slip one end of the lamp into the lampholder with the flexible spring base — this allows sufficient clearance for the lamp pins on the opposite end of the lamp to be slipped into the facing lampholder having a solid base. Pressure of the lifetime spring securely locks lamp in place and entirely eliminates possibility of lamp dropping out.

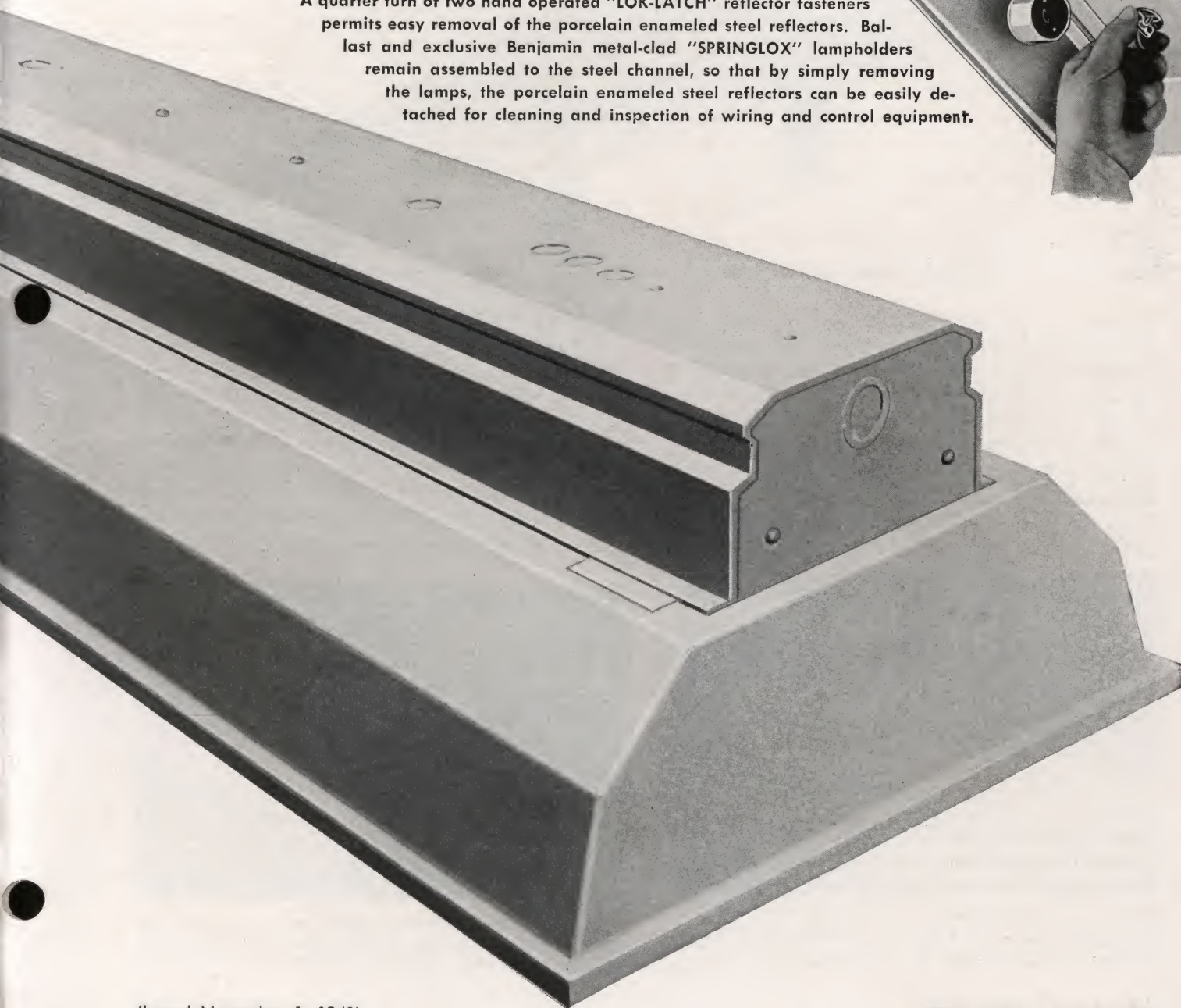


The rigid Channel Coupling joins channel sections end to end and insures accurate alignment of long continuous lines. Coupling slides into the ends of channels and is held securely by tightening two attaching screws.



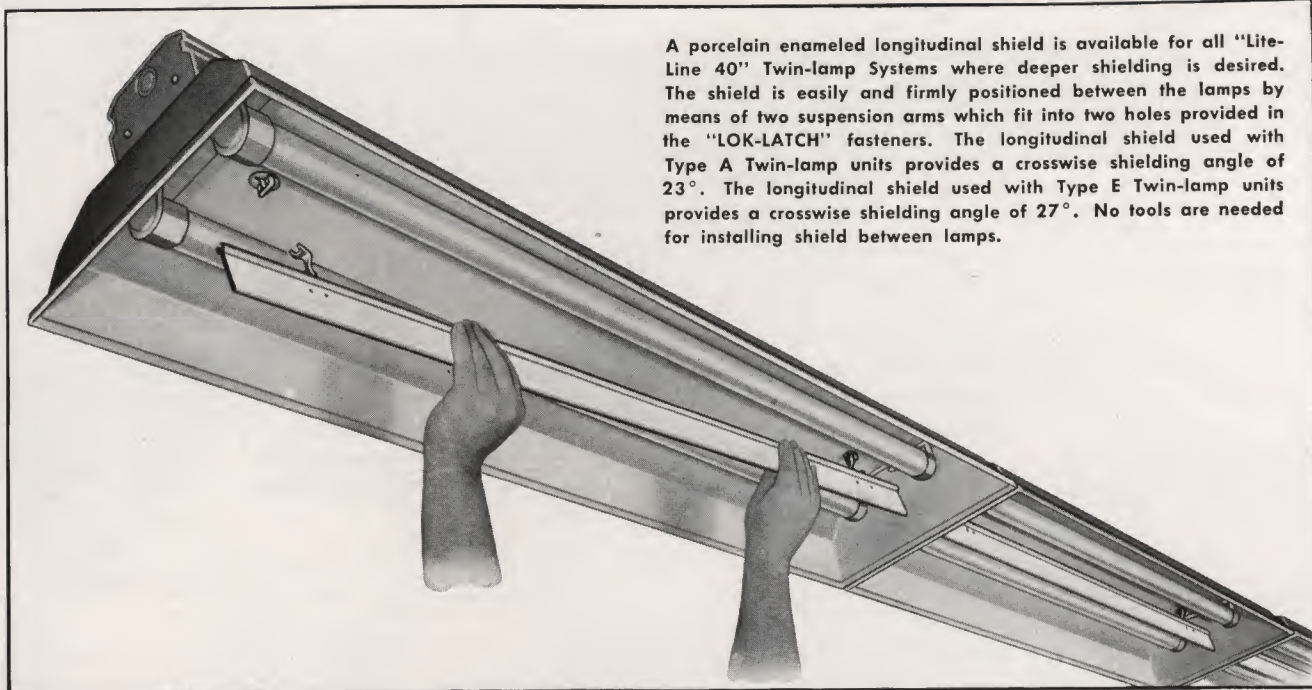


A quarter turn of two hand operated "LOK-LATCH" reflector fasteners permits easy removal of the porcelain enameled steel reflectors. Ballast and exclusive Benjamin metal-clad "SPRINGLOX" lampholders remain assembled to the steel channel, so that by simply removing the lamps, the porcelain enameled steel reflectors can be easily detached for cleaning and inspection of wiring and control equipment.



Lighting Applications

for RLM "Lite-Line 40" System



A porcelain enameled longitudinal shield is available for all "Lite-Line 40" Twin-lamp Systems where deeper shielding is desired. The shield is easily and firmly positioned between the lamps by means of two suspension arms which fit into two holes provided in the "LOK-LATCH" fasteners. The longitudinal shield used with Type A Twin-lamp units provides a crosswise shielding angle of 23° . The longitudinal shield used with Type E Twin-lamp units provides a crosswise shielding angle of 27° . No tools are needed for installing shield between lamps.

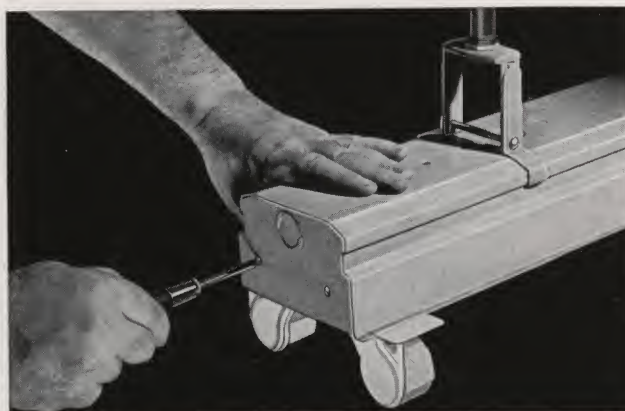
Benjamin "Lite-Line 40" Systems utilizing two 40-watt fluorescent lamps per reflector provide illumination levels of approximately 45 to 100 footcandles at usual spacing and mounting heights. "Lite-Line 40" Systems utilizing three 40-watt fluorescent lamps per reflector provide approximately 37% more light than the twin-lamp systems, or illumination levels of 62 to 137 footcandles. All of these values are based on the use of 3500° "white" fluorescent lamps.

The continuous reflector design of "Lite-Line 40" Systems makes it possible to obtain more lumens per square foot of room area than is practical using individual units. Therefore, when mounting heights are slightly greater than those recommended for individual fluorescent lighting units, or where greater intensities are desired at normal mounting heights, "Lite-Line 40" Systems are recommended. Continuous fluorescent systems are particularly applicable for the illumination of assembly lines, drafting rooms, clothing industries, aircraft industries, automotive industries, etc., and all locations where it is imperative to reduce shadows to a minimum and maintain high levels of illumination.

Light Output—The design of the reflector, high reflection factor of the porcelain enamel and proper positioning of the lamps combine to give an efficiency of 79% or more of the lumen output of the lamps for twin-lamp reflectors, and 72% or more for triple-lamp reflectors. The porcelain enameled reflector readily maintains its original efficiency.

Shielding Angle—On twin-lamp units, when a line is drawn perpendicular to the reflector edge and tangent to the lower edge of the opposite lamp, this line forms a shielding angle of 13 degrees. Triple-lamp units also have a 13 degree shielding angle.

For deeper shielding a porcelain enameled longitudinal shield is available for all "Lite-Line 40" Twin-lamp Systems. The longitudinal shield affords a 23° crosswise shielding angle with the horizontal for Type A Twin-lamp units, and a 27° crosswise shielding angle for Type E Twin-lamp units.



End Caps for closing the exposed ends of channel sections at both ends of the continuous line are easily attached by tightening two holding screws which are regularly supplied with each end cap.

General Specifications

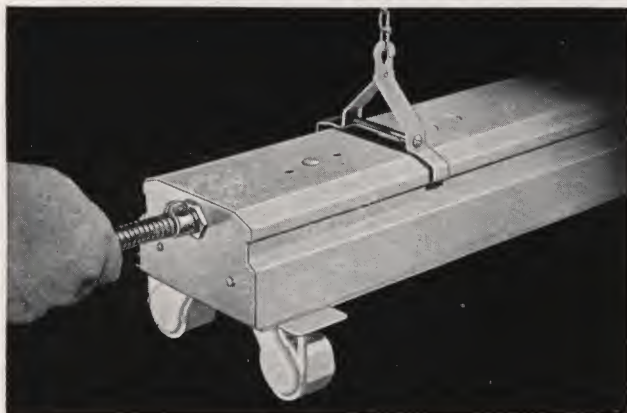
for RLM "Lite-Line 40" System

Channels—Fabricated of 20 gauge steel, finished inside and out with durable gray baked enamel. Channels contain control equipment for operating either two or three fluorescent lamps per reflector, and a facing pair of Benjamin Metal-clad "SPRINGLOX" Lampholder assemblies in twin or triple-lamp arrangements. Channels are supplied wired and have 6-inch leads, and are constructed with a continuous groove along their entire length to accommodate sliding hanger suspension fittings at any point along the continuous line.

Reflectors—Reflectors are made of porcelain enameling iron, completely covered with Benjamin lifetime porcelain enamel—outer surfaces are finished gray; reflecting surfaces white, with a reflection factor of 79% or more. Reflectors can be detached from channel by a quarter turn of two hand operated "LOK-LATCH" fasteners.

Ballasts and Starters—Twin and Triple-lamp "Lite-Line 40" Systems are supplied with conventional type, high power factor, ballasts. Twin-lamp Systems are also available with twin-lamp, high power factor, instant starting ballasts. All ballasts operate lamps out of phase to minimize cyclic light flicker. Channels with conventional type ballasts are supplied with FS40 non-blinking type manual reset starters, or FS4 Glow-Switch Starters. All starters are easily removed for inspection or replacement.

Power Consumption—Each twin-lamp double reflector channel, complete with lamps and conventional ballasts, consumes approximately 200 watts. Each twin-lamp double reflector channel, complete with lamps and instant starting ballasts uses approximately 220 watts. Each triple-lamp double reflector channel uses approximately 300 watts.



A combination $\frac{1}{2}$ and $\frac{3}{4}$ -inch knockout is provided in channel end caps for bringing in line wires at the end of rows, or lines can be brought in at practically any point on the top of channel. All chan-

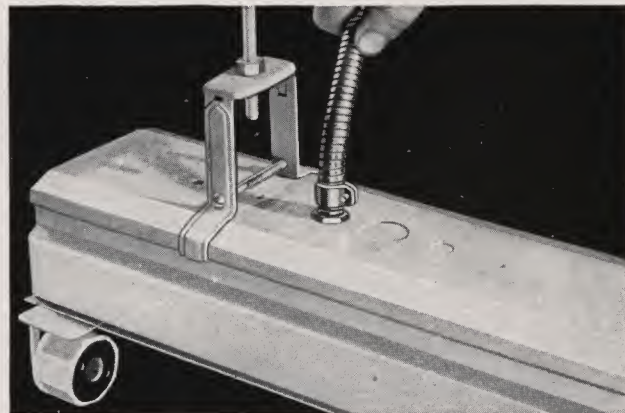
Provisions for Grounding—Metal to metal bond is provided between electrical units and channels for grounding.

Methods of Suspension—A complete line of specially designed sliding hanger type suspension fittings, which can be located at any point along the continuous groove provided in top of the channel sections, is listed on pages 462 and 463. Convenient knockouts for stationary conduit or rod suspension are also located in the top of the channel sections. For location and size of knockouts see dimensional data on page 465.

Assured Performance

Auxiliary control equipment is certified by Electrical Testing Laboratories and by the manufacturer. Complete units, ballasts, lampholders and starters, are listed separately by Underwriters' Laboratories, and carry Underwriters' Inspection Label. "Lite-Line 40" Units meet RLM specifications and bear the RLM label which is an assurance of uniform quality and light output.

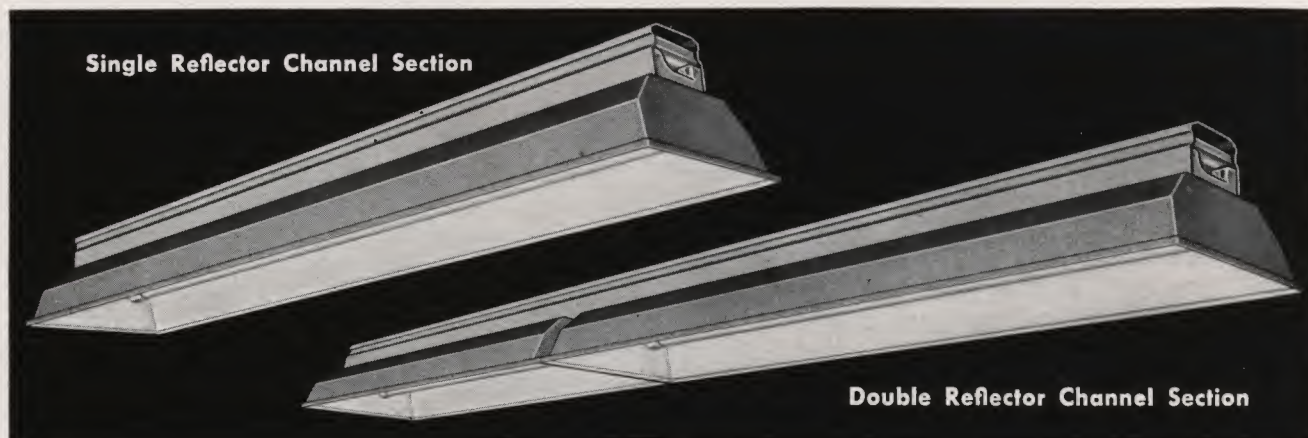
Guarantee—Benjamin lighting units when properly installed and under normal conditions of use, are guaranteed against mechanical and electrical defects for a period of one year from date of delivery to the purchaser, with the exception of the lamp starters for which the guarantee is limited to a period of 90 days. Correction of such defects by repair or replacement of material only shall constitute fulfillment of all obligations under this guarantee by the Benjamin Electric Manufacturing Company.



nel sections are provided with a number of $\frac{1}{2}$ and $\frac{3}{4}$ -inch conduit size knockouts. For location of channel knockouts for Type A and Type E "Lite-Line 40" Systems see dimensional data on page 465.

Technical Specifications

for Type A and Type E "Lite-Line 40" Systems



GENERAL SPECIFICATIONS

The basis of this continuous fluorescent system shall be single and double-reflector channel sections with closed or open-end porcelain enameled steel reflectors, which can be joined end to end by means of a rigid channel coupling to form a continuous wireway enclosure. This continuous fluorescent system shall consist primarily of single and double-reflector channel sections, RLM standard reflectors, certified control equipment and metal-clad spring type lampholders.

MATERIAL SPECIFICATIONS

Reflectors—The reflectors shall be constructed of 20 gauge porcelain enameling iron completely covered with durable porcelain enamel; outer surfaces finished gray, inner surfaces reflecting white. Reflection factor of reflectors shall be 79% or more. All surfaces of the reflector shall be completely covered and free from blisters, cracks, chips, specks and other defects affecting reflector efficiency, durability or appearance.

The units shall be constructed so as to eliminate the use of tools for removal of the reflectors for cleaning or for inspection of the wiring, control equipment and lampholders. Lampholders and starters shall extend through the reflector without being fastened to it, so as to permit easy removal of reflectors while lampholders and all control equipment remain attached to the channel.

Where a "Type A" continuous fluorescent system is specified, the reflectors shall be of the following dimensions: length $50\frac{3}{4}$ -inches; width $11\frac{1}{2}$ -inches; height $3\frac{27}{32}$ -inches. "Type A" $11\frac{1}{2}$ -inch width reflectors shall be of open-end type construction and shall afford a crosswise shielding angle of 13 degrees. Reflectors shall accommodate two 40-watt, 48-inch, T-12 fluorescent lamps.

Where a "Type E" continuous fluorescent system is specified, the reflectors shall be of the following dimensions:

Closed-end reflectors—length $53\frac{3}{4}$ -inches, width $13\frac{1}{8}$ -inches, height $4\frac{7}{32}$ -inches; Open-end reflectors—length $53\frac{3}{8}$ -inches, width $13\frac{1}{8}$ -inches, height $4\frac{7}{32}$ -inches. Both closed and open-end "Type E" $13\frac{1}{8}$ -inch width reflectors shall afford a crosswise shielding angle of 13 degrees. Reflectors shall be constructed so as to accommodate either two or three 40-watt, 48-inch, T-12 fluorescent lamps.

Channels—The single and double-reflector channel sections shall be constructed of 20 gauge steel; finished inside and out in durable baked gray enamel. The channel sections together with the reflector shall completely enclose all wiring and ballast equipment, and when joined end to end shall form a continuous wireway enclosure. Knockouts in top of single-reflector channel sections shall be provided as follows: 1 pair $\frac{3}{8}$ -inch iron pipe size knockouts on $19\frac{1}{2}$ -inch centers; 1 pair $\frac{3}{4}$ -inch iron pipe size knockouts on 33-inch centers; 1 pair $\frac{1}{2}$ -inch iron pipe size knockouts on 36-inch centers. Double-reflector channel sections shall have two sets of each of the aforementioned knockouts. Single-reflector channel sections shall support a single reflector. Double-reflector channel sections shall support two reflectors.

Where a "Type A" continuous fluorescent system is specified, channel sections only shall conform to the following dimensions: Single-reflector channel sections—length $50\frac{3}{8}$ -inches, width $4\frac{1}{8}$ -inches, height $2\frac{3}{32}$ -inches; Double-reflector channel sections—length $101\frac{3}{8}$ -inches, width $4\frac{1}{8}$ -inches, height $2\frac{3}{32}$ -inches. Metal-clad lampholder assemblies in "Type A" channel sections shall space lamps on $3\frac{1}{2}$ -inch centers.

Where a "Type E" continuous fluorescent system is specified, channel sections only shall conform to the following dimensions: Single-reflector channel sections—length $50\frac{3}{8}$ -inches, width $4\frac{1}{8}$ -inches, height $2\frac{3}{32}$ -inches; Double-reflector channel sections—length $104\frac{3}{8}$ -inches, width $4\frac{1}{8}$ -inches,

Technical Specifications

for Type A and Type E "Lite-Line 40" Systems

height $2\frac{3}{8}$ -inches. Metal-clad lampholder assemblies in "Type E" Twin-lamp channels shall space lamps on 5-inch centers. Metal-clad lampholder assemblies in "Type E" Triple-lamp channels shall space lamps on $2\frac{1}{2}$ -inch centers.

Channels shall be designed so as to accommodate sliding hanger suspension fittings at any point along the line.

Couplings—The channel coupling for connecting single or double reflector channel sections end to end shall be constructed of 20 gauge steel, finished in baked gray enamel. The coupling shall be easily inserted into the ends of single or double-reflector channel sections and shall be fastened securely by two screws. Couplings shall be durably constructed so as to afford accurate alignment of lines.

Overall coupling length for Type A "Lite-Line 40" systems shall be $8\frac{5}{8}$ -inches and provide $\frac{5}{8}$ -inch spacing between channels. Overall coupling length for Type E "Lite-Line 40" systems shall be $11\frac{5}{8}$ -inches and provide $3\frac{3}{8}$ -inch spacing between channels.

End Caps—The end caps shall be constructed of 16 gauge steel, finished baked gray enamel. End caps shall close the exposed ends of channel sections at either end of the line and shall be easily positioned by tightening two attaching screws. End caps shall be provided with a combination $\frac{1}{2}$ and $\frac{3}{4}$ -inch iron pipe size knockout.

Lampholders—Lampholder assemblies shall be of metal-clad construction, entirely eliminating breakage of lampholders upon insertion or removal of lamps. Lampholders shall be of spring type construction to accommodate fluorescent lamps of minimum and maximum length tolerance, and are to provide positive electrical contact in addition to eliminating lamps from binding or dropping out. Lampholders shall be easily and firmly positioned within the wiring channel without means of mechanical fastening devices requiring the use of tools. The one piece metal-clad lampholders shall be of two or three receptacle design, and shall permit light to pass between the lamp receptacles, thereby minimizing negative influence on reflector efficiency. Base metal of lampholders shall be heavily cadmium plated over which shall be applied a protective bond coat. Finish coat shall be baked white enamel.

Ballasts and Starters—Twin-lamp channels shall be supplied with either conventional or instant starting ballasts. Triple-lamp channels shall be supplied with conventional ballasts. All ballasts shall have a power factor of 95% or more and shall operate lamps out of phase to minimize cyclic light flicker. Channels with conventional ballasts shall

be supplied with either (FS40) non-blinking manual reset starters or (FS4) glow-switch starters. All starters shall be positioned so that they can be easily removed. Ballasts and starters shall be in compliance with the latest issue of "Mazda Lamp Manufacturers' Specifications for Fluorescent Lamp Auxiliaries", certified by Electrical Testing Laboratories.

Suspension Fittings—Channels and Channel Couplings shall be constructed so as to accommodate sliding hanger type conduit, chain, cable, and single or twin-rod suspension fittings. Knockouts shall also be provided in top of channels so that when desired conduit, chain, rod or ceiling strap can be attached directly to channel.

LIGHTING SPECIFICATIONS

Shielding Angle—Lampholders and reflectors for twin-lamp units shall be designed so that a line drawn perpendicular to the reflector edge and tangent to the lower edge of the opposite lamp will form a crosswise shielding angle of 13 degrees with the horizontal. Triple-lamp units shall also have a 13 degree shielding angle. Where deeper shielding is desired, a white matte finish porcelain enameled longitudinal shield shall be used. The longitudinal shield shall have a reflection factor of 79% or more and shall meet RLM Shielding and Brightness Specifications. The shield shall be easily and firmly positioned between the lamps of twin-lamp units without the use of tools. The longitudinal shield shall provide a 23 degree crosswise shielding angle for "Type A" Twin-lamp continuous fluorescent systems. The longitudinal shield shall provide a 27 degree crosswise shielding angle for "Type E" Twin-lamp continuous fluorescent systems.

Efficiency—The design of reflector, reflection factor of the porcelain enamel and position of the lamps shall give an efficiency of 79% or more of the output of lamps for all twin-lamp reflectors, and 72% or more for all triple-lamp reflectors. Type A twin-lamp reflectors with shield shall have an efficiency of 67% or more: Type E twin-lamp reflectors with shield shall have an efficiency of 70% or more.

PERFORMANCE SPECIFICATIONS

Auxiliary control equipment shall be certified by Electrical Testing Laboratories. Complete units; ballasts, lampholders and starters, shall be listed separately by Underwriters' Laboratories, and carry the Underwriters' Inspection label. Units are to meet RLM specifications for uniform quality and light output and bear the RLM label.

Type A Twin-Lamp "Lite-Line 40" Channels

for No. 8452 Open-end 11 1/2-inch Width Reflectors listed on page 457
3 1/2-inch Lamp Centers — Wired and Equipped for Two 40-watt (48-inch) Lamps per Reflector

Listed by Underwriters' Laboratories

Double Channel Sections

8'5 3/8" Long



WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycle*	2 Twin Lamp Ballasts—95% Power Factor	29	18154-W	\$41.70
220-250 Volts, 60 Cycle*	2 Twin Lamp Ballasts—95% Power Factor	29	18156-W	41.70

WITH CONVENTIONAL BALLASTS AND (FS-4) STARTERS

110-125 Volts, 60 Cycle*	2 Twin Lamp Ballasts—95% Power Factor	29	18154	38.90
220-250 Volts, 60 Cycle*	2 Twin Lamp Ballasts—95% Power Factor	29	18156	38.90

WITH INSTANT STARTING BALLASTS—NO LAMP STARTERS NEEDED

110-125 Volts, 60 Cycle	2 Twin Lamp Ballasts—95% Power Factor	39	18254	54.30
-------------------------	---------------------------------------	----	-------	-------

Single Channel Sections

4'2 3/8" Long



WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	14 1/2	18354-W	\$20.40
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	14 1/2	18356-W	20.40

WITH CONVENTIONAL BALLASTS AND (FS-4) STARTERS

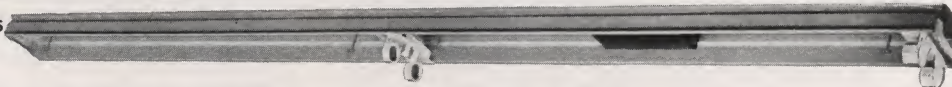
110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	14 1/2	18354	19.00
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	14 1/2	18356	19.00

WITH INSTANT STARTING BALLASTS—NO LAMP STARTERS NEEDED

110-125 Volts, 60 Cycle	1 Twin Lamp Ballast—95% Power Factor	18 1/2	18654	26.70
-------------------------	--------------------------------------	--------	-------	-------

★ Half-Blank Channel Sections

8'5 3/8" Long



WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	20 1/2	18194-W	\$27.90
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	20 1/2	18196-W	27.90

WITH CONVENTIONAL BALLASTS AND (FS-4) STARTERS

110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	20 1/2	18194	26.50
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	20 1/2	18196	26.50

WITH INSTANT STARTING BALLASTS—NO LAMP STARTERS NEEDED

110-125 Volts, 60 Cycle	1 Twin Lamp Ballast—95% Power Factor	25	18294	34.20
-------------------------	--------------------------------------	----	-------	-------

★ Blank Channel Sections

Description	Net Wt. Lbs. Each	Cat. No.	List Price
‡Single Blank Channel Section	6	18410	\$ 6.60
‡Double Blank Channel Section	12 1/2	18800	14.10
■Blank Channel Cover Only	4	18401	2.20

‡Cover not included. Order separately.

■Used to close bottom of Channel when reflector is omitted.

One cover required for each reflector omitted.

Channels finished gray enamel; supplied wired with 6-inch leads. For complete specifications see page 453.

★ Half-Blank and Blank Channel Sections are used for making various Skip-Section "Lite-Line" arrangements. On half-blank channel sections only one side is complete with lampholders and control equipment. On single and double blank channel sections all control equipment and lampholders have been omitted. Lampholders and control equipment can be added at a later date. Channels do not include No. 18401 blank cover.

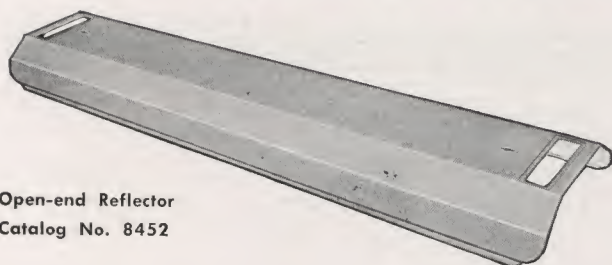
†Units supplied with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional type ballast prices.

*50 cycle ballast units supplied; prices quoted upon application.
Lamps Not Supplied

Type A Twin-Lamp "Lite-Line 40" Parts

for use with Channels listed on opposite page 456

RLM Heavy Duty (11½-inch Width) Porcelain Enameled Steel Reflectors



Open-end Reflector
Catalog No. 8452

Open-end RLM Reflectors of 20 gauge enameling iron; completely covered with porcelain enamel, gray outside, white inside, with a reflection factor of 79% or more. Reflectors are attached to channel by a quarter turn of two hand operated "LOK-LATCH" reflector fasteners, supplied with channels. Shielding angle is 13 degrees. Type A Reflectors will not fit Type E Channels.

For deeper shielding, reflectors can be furnished with a porcelain enameled longitudinal shield which attaches to two holes provided in each "LOK-LATCH" reflector fastener. This shield provides a crosswise shielding angle of 23 degrees.

Reflector Type	No. of 40-Watt Lamps	Dimension in Inches		Without Shield			With No. 8445 Shield†		
		Length	Width	Net Wt. Lbs. Each	Cat. No.	List Price	Net Wt. Lbs. Each	Cat. No.	List Price
Open-end*	2	50¾	11½	10	8452	\$7.20	12	8450	\$9.80

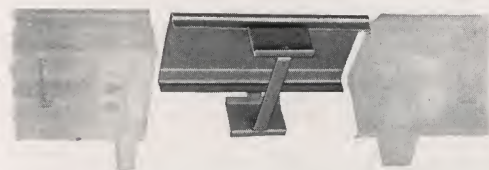
*Type A Twin-Lamp Systems are supplied with open-end 11½-inch width reflectors only. Where closed-end reflectors are desired, use Type E Twin-Lamp Channels and Parts listed on pages 458 and 459.

†Shield only—Cat. No. 8445, List Price \$2.60

Channel Coupling and Channel End Cap

Coupling for joining channel sections is sturdily constructed of 20 gauge steel; finished gray enamel. Includes attaching screw and has a ⅜-inch D.K.O. in top. Provides ⅝-inch spacing between channels; overall coupling length is 8⅝-inches.

Channel End Caps are used at each end of the line for closing the channel sections. They are of 16 gauge steel construction and are provided with a combination ½-inch and ¾-inch I.P.K.O. End Caps are easily attached using two screws supplied. Finish gray enamel.



Channel Coupling
Catalog No. 18436



End Cap
Catalog No. 18425

Description	Net Wt. Lbs. Each	Cat. No.	List Price
Coupling for Type A Channels Only	1	18436	\$0.90
End Cap for both Type A and Type E Channels	¼	18425	.40

Suspension Fittings for Mounting Lines

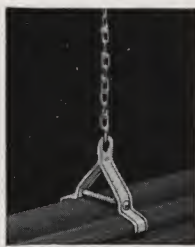
For additional methods of suspension, see pages 462 and 463.



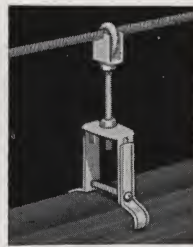
Stationary Ceiling†
Cat. No. 18431
List Price \$0.50



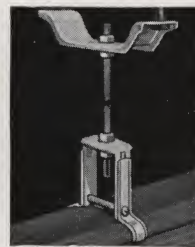
Sliding ½" Conduit†
Cat. No. 18443
List Price \$1.10



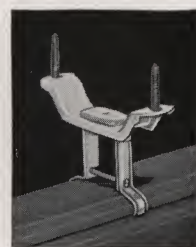
Sliding Chain†
Cat. No. 18450
List Price \$0.60



Sliding Cable†
Cat. No. 18472
List Price \$1.20



Sliding ¾" Single Rod†
Cat. No. 18439‡
List Price \$1.10



Sliding Ceiling†
Cat. No. 18439‡
List Price \$1.10

Suspension Fittings finished gray enamel.

†Conduit, Chain, Cable, Rod and Lag Screws not Supplied.

‡Used for both Single Rod and Sliding Ceiling.

Type E Twin-Lamp "Lite-Line 40" Channels

for No. 8462 Closed-end or No. 8453 Open-end 13 1/8-inch Width Reflectors on page 459.
5-inch Lamp Centers — Wired and Equipped for Two 40-watt (48-inch) Lamps per Reflector

Listed by Underwriters' Laboratories

Double Channel Sections

8'8 3/8" Long



WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycle*	2 Twin Lamp Ballasts—95% Power Factor	29 1/2	18854-W	\$42.30
220-250 Volts, 60 Cycle*	2 Twin Lamp Ballasts—95% Power Factor	29 1/2	18856-W	42.30

WITH CONVENTIONAL BALLASTS AND (FS-4) STARTERS

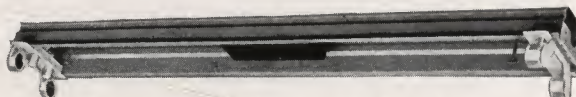
110-125 Volts, 60 Cycle*	2 Twin Lamp Ballasts—95% Power Factor	29 1/2	18854	39.50
220-250 Volts, 60 Cycle*	2 Twin Lamp Ballasts—95% Power Factor	29 1/2	18856	39.50

WITH INSTANT STARTING BALLASTS—NO LAMP STARTERS NEEDED

110-125 Volts, 60 Cycle	2 Twin Lamp Ballasts—95% Power Factor	39 1/2	18954	54.90
-------------------------	---------------------------------------	--------	-------	-------

Single Channel Sections

4'2 3/8" Long



WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	15	18454-W	\$20.60
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	15	18456-W	20.60

WITH CONVENTIONAL BALLASTS AND (FS-4) STARTERS

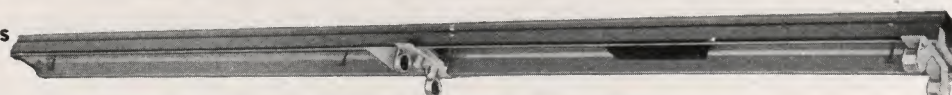
110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	15	18454	19.20
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	15	18456	19.20

WITH INSTANT STARTING BALLASTS—NO LAMP STARTERS NEEDED

110-125 Volts, 60 Cycle	1 Twin Lamp Ballast—95% Power Factor	19	18554	26.90
-------------------------	--------------------------------------	----	-------	-------

★ Half-Blank Channel Sections

8'8 3/8" Long



WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	21	18894-W	\$28.30
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	21	18896-W	28.30

WITH CONVENTIONAL BALLASTS AND (FS-4) STARTERS

110-125 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	21	18894	26.90
220-250 Volts, 60 Cycle*	1 Twin Lamp Ballast—95% Power Factor	21	18896	26.90

WITH INSTANT STARTING BALLASTS—NO LAMP STARTERS NEEDED

110-125 Volts, 60 Cycle	1 Twin Lamp Ballast—95% Power Factor	25 1/2	18994	34.60
-------------------------	--------------------------------------	--------	-------	-------

★ Blank Channel Sections

Description	Net Wt. Lbs. Each	Cat. No.	List Price
†Single Blank Channel Section	6	18410	\$ 6.60
†Double Blank Channel Section	13	18810	14.30
■Blank Channel Cover Only	4	18401	2.20

†Cover not included. Order separately.

■Used to close bottom of Channel when reflector is omitted.

One cover required for each reflector omitted.

Channels finished gray enamel; supplied wired with 6-inch leads. For complete specifications see page 453.

★ Half-Blank and Blank Channel Sections are used for making various Skip-Section "Lite-Line" arrangements. On half-blank channel sections only one side is complete with lampholders and control equipment. On single and double blank channel sections all control equipment and lampholders have been omitted. Lampholders and control equipment can be added at a later date. Channels do not include No. 18401 blank cover.

†Units supplied with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional type ballast prices.

*50 cycle ballast units supplied; prices quoted upon application.

Lamps Not Supplied

Improved Channel Couplings for "Lite-Line 40" Systems

For Type E "Lite-Line 40" Systems listed on Pages 344 & 346

An improvement in our Type E "Lite-Line 40" Fluorescent System not previously announced is a change in the coupling used for joining channel sections end-to-end.

The improved coupling is equipped with four shearings (or raised vertical slots). These shearings slip into slotted openings in the ends of the fluorescent channels when the channel sections are joined end-to-end. With this construction, the channel sections will remain in positive engagement, even though the attaching screws joining the coupling to the channel may loosen or drop out. These improved couplings have been in use in the field for some time and their performance has been more than satisfactory.

For some time "Lite-Line 40" channels have been provided with slotted openings to accommodate the new style coupling.

It was found that the same new style coupling could be used for both "Magna-Flo" Systems and Type E "Lite-Line 40" Systems. Accordingly Catalog No. 18426 Type E coupling has been dropped and we supply coupling Catalog No. 9601, listed on page 347C-7 for both systems. No orders can be accepted for the old style coupling.

For Type A "Lite-Line 40" Systems listed on Page 342

Type A "Lite-Line 40" Systems require a different length coupling than is used with Type E "Lite-Line 40" Systems and "Magna-Flo" Systems. Accordingly Catalog No. 18436 Type A coupling was revised some time ago to incorporate the new coupling features described above. There is no change in Catalog Number. The old style Catalog No. 18436 coupling is no longer available. No orders can be accepted for the old style coupling.

(Issued June 5, 1952)

(File next to Page 344 in the
Benjamin General Catalog)

Type E Twin-Lamp "Lite-Line 40" Parts

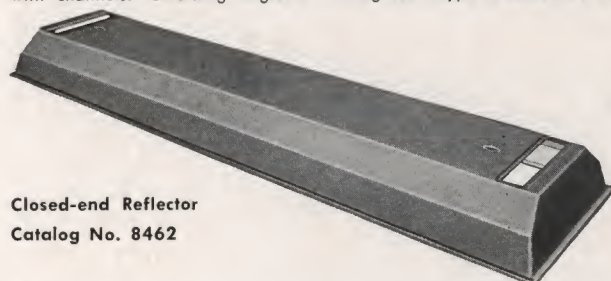
for use with Channels listed on opposite page 458

RLM Heavy Duty (13 1/8-inch Width) Porcelain Enameled Steel Reflectors

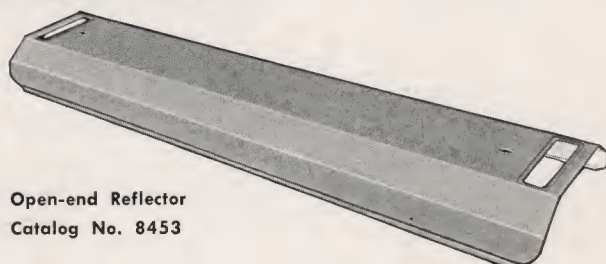
Closed and Open-end RLM Reflectors of 20 gauge enameled iron; completely covered with porcelain enamel, gray outside, white inside, with a reflection factor of 79% or more. Reflectors are attached to channel by a quarter turn of two hand operated "LOK-LATCH" fasteners supplied with channels. Shielding angle is 13 degrees. Type E Reflectors will

not fit Type A Channels.

For deeper shielding, reflectors can be furnished with a porcelain enameled longitudinal shield which attaches to two holes provided in each "LOK-LATCH" reflector fastener. This shield provides a crosswise shielding angle of 27 degrees.



Closed-end Reflector
Catalog No. 8462



Open-end Reflector
Catalog No. 8453

Reflector* Type	No. of 40-Watt Lamps	Dimension in Inches		Without Shield			With No. 8446 Shield†		
		Length	Width	Net Wt. Lbs. Each	Cat. No.	List Price	Net Wt. Lbs. Each	Cat. No.	List Price
Closed-end	2	53 3/4	13 1/8	12 1/2	8462♦	\$12.00	15	8463	\$14.60
Open-end	2	53 3/8	13 1/8	12	8453♦	7.60	14 1/2	8451	10.20

♦ Same reflectors are used for both Twin and Triple-Lamp Type E Systems.

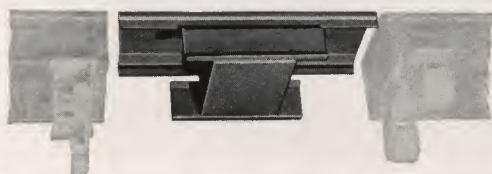
* Flat Reflector, 13" wide, Cat. No. 8448, available at \$5.00 List Price.

† Shield only—Cat. No. 8446, List Price \$2.60

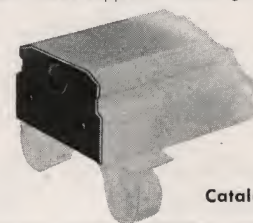
Channel Coupling and Channel End Cap

Coupling for joining channel sections is sturdily constructed of 20 gauge steel; finished gray enamel. Includes two attaching screws and has a 1/2-inch I.P.K.O. in top. Provides 3 5/8-inch spacing between channels; overall coupling length is 11 5/8-inches.

Channel End Caps are used at each end of the line for closing the channel sections. They are of 16 gauge steel construction and are provided with a combination 1/2-inch and 3/4-inch I.P.K.O. End Caps are easily attached using two screws supplied. Finish gray enamel.



Channel Coupling
Catalog No. 18426



End Cap
Catalog No. 18425

Description	Net Wt. Lbs. Each	Cat. No.	List Price
Coupling for all Type E Channels	1 1/2	18426	\$1.10
End Cap for both Type A and Type E Channels	1/4	18425	.40

Suspension Fittings for Mounting Lines

For additional methods of suspension, see pages 462 and 463.



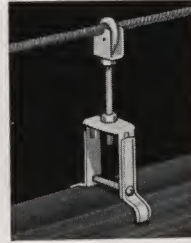
Stationary Ceiling†
Cat. No. 18431
List Price \$0.50



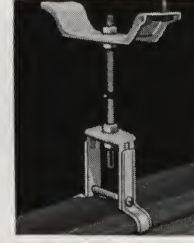
Sliding 1/2" Conduit†
Cat. No. 18443
List Price \$1.10



Sliding Chain†
Cat. No. 18450
List Price \$0.60



Sliding Cable†
Cat. No. 18472
List Price \$1.20



Sliding 3/8" Single Rod†
Cat. No. 18439‡
List Price \$1.10



Sliding Ceiling†
Cat. No. 18439‡
List Price \$1.10

* Suspension Fittings finished gray enamel.

† Conduit, Chain, Cable, Rod and Log Screws not Supplied.

‡ Used for both Single Rod and Sliding Ceiling.

(Issued November 1, 1948) • net schedule 2-F

BENJAMIN • page 459

(From General Catalog)

Type E Triple-Lamp "Lite-Line 40" Channels

for No. 8462 Closed-end or No. 8453 Open-end 13 1/8-inch Width Reflectors on page 461.
2 1/2-inch Lamp Centers — Wired and Equipped for Three 40-watt (48-inch) Lamps per Reflector

Listed by Underwriters' Laboratories

Double Channel Sections

8'8 3/8" Long



WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycle*	3 Twin Lamp Ballasts—95% Power Factor	36 1/2	18857-W	\$61.40
220-250 Volts, 60 Cycle*	3 Twin Lamp Ballasts—95% Power Factor	36 1/2	18859-W	61.40

WITH CONVENTIONAL BALLASTS AND (FS-4) STARTERS

110-125 Volts, 60 Cycle*	3 Twin Lamp Ballasts—95% Power Factor	36 1/2	18857	57.20
220-250 Volts, 60 Cycle*	3 Twin Lamp Ballasts—95% Power Factor	36 1/2	18859	57.20

Single Channel Sections

4'2 3/8" Long



WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	18 1/2	18457-W	\$31.30
220-250 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	18 1/2	18459-W	30.30

WITH CONVENTIONAL BALLASTS AND (FS-4) STARTERS

110-125 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	18 1/2	18457	29.20
220-250 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	18 1/2	18459	28.20

★ Half-Blank Channel Sections

8'8 3/8" Long



WITH CONVENTIONAL BALLASTS AND NON-BLINKING (FS-40) STARTERS

Line Voltage†	Control Equipment	Net Wt. Lbs. Each	Cat. No.	List Price
110-125 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	24 1/2	18897-W	\$39.00
220-250 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	24 1/2	18899-W	38.00

WITH CONVENTIONAL BALLASTS AND (FS-4) STARTERS

110-125 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	24 1/2	18897	36.90
220-250 Volts, 60 Cycle*	1 Triple Lamp Ballast—95% Power Factor	24 1/2	18899	35.90

★ Blank Channel Sections

Description	Net Wt. Lbs. Each	Cat. No.	List Price
†Single Blank Channel Section	6	18410	\$ 6.60
†Double Blank Channel Section	13	18810	14.30
■Blank Channel Cover Only	4	18401	2.20

†Cover not included. Order separately.

■Used to close bottom of Channel when reflector is omitted.
One cover required for each reflector omitted.

Channels finished gray enamel; supplied wired with 6-inch leads. For complete specifications see page 453.

★ Half-Blank and Blank Channel Sections are used for making various Skip-Section "Lite-Line" arrangements. On half-blank channel sections only one side is complete with lampholders and control equipment. On single and double blank channel sections all control equipment and lampholders have been omitted. Lampholders and control equipment can be added at a later date. Channels do not include No. 18401 blank cover.

†Units supplied with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional type ballast prices.

*50 cycle ballast units supplied; prices quoted upon application.
Lamps Not Supplied

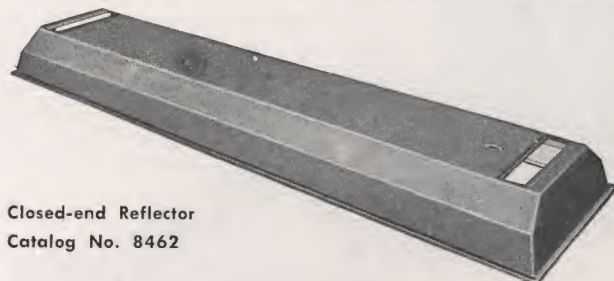
Type E Triple-Lamp "Lite-Line 40" Parts

for use with Channels listed on opposite page 460

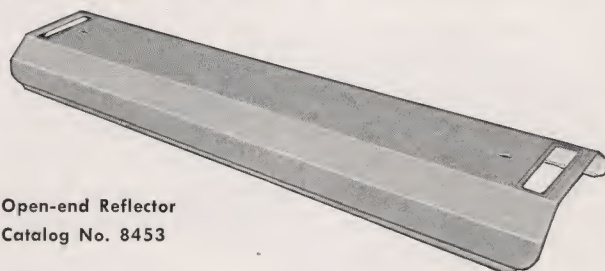
RLM Heavy Duty (13 1/8-inch Width) Porcelain Enameled Steel Reflectors

Closed and Open-end RLM Reflectors of 20 gauge enameling iron; completely covered with porcelain enamel, gray outside, white inside, with a reflection factor of 79% or more. Reflectors are attached to channel

by a quarter turn of two hand operated "LOK-LATCH" fasteners supplied with channels. Shielding angle is 13 degrees. Type E Reflectors will not fit Type A Channels.



Closed-end Reflector
Catalog No. 8462



Open-end Reflector
Catalog No. 8453

Reflector* Type	No. of 40-Watt Lamps	Dimension in Inches		Net Wt. Lbs. Each	Cat. No.	List Price
		Length	Width			
Closed-end	3	53 3/4	13 1/8	12 1/2	8462♦	\$12.00
Open-end	3	53 5/8	13 1/8	12	8453♦	7.60

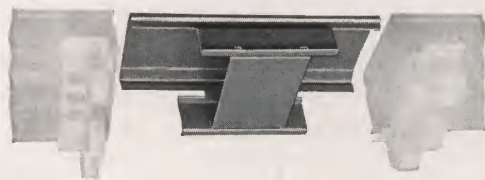
♦ Same reflectors are used for both Twin and Triple-Lamp Type E Systems.

* Flat Reflector, 13" wide, Cat. No. 8448, available at \$5.00 List Price.

Channel Coupling and Channel End Cap

Coupling for joining channel sections is sturdily constructed of 20 gauge steel; finished gray enamel. Includes two attaching screws and has a 1/2-inch I.P.K.O. in top. Provides 3 5/8-inch spacing between channels; overall coupling length is 11 5/8-inches.

Channel End Caps are used at each end of the line for closing the channel sections. They are of 16 gauge steel construction and are provided with a combination 1/2-inch and 3/4-inch I.P.K.O. End Caps are easily attached using two screws supplied. Finish gray enamel.



Channel Coupling
Catalog No. 18426



End Cap
Catalog No. 18425

Description	Net Wt. Lbs. Each	Cat. No.	List Price
Coupling for all Type E Channels	1 1/2	18426	\$1.10
End Cap for both Type A and Type E Channels	1/4	18425	.40

Suspension Fittings for Mounting Lines

For additional methods of suspension, see pages 462 and 463.



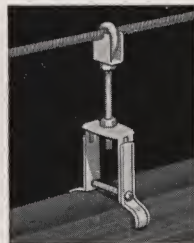
Stationary Ceiling†
Cat. No. 18431
List Price \$0.50



Sliding 1/2" Conduit†
Cat. No. 18443
List Price \$1.10



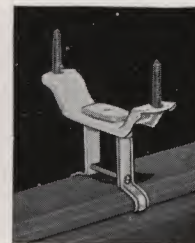
Sliding Chain†
Cat. No. 18450
List Price \$0.60



Sliding Cable†
Cat. No. 18472
List Price \$1.20



Sliding 3/8" Single Rod†
Cat. No. 18439‡
List Price \$1.10



Sliding Ceiling†
Cat. No. 18439‡
List Price \$1.10

Suspension Fittings finished gray enamel.

† Conduit, Chain, Cable, Rod and Lag Screws not Supplied.
‡ Used for both Single Rod and Sliding Ceiling.

(Issued November 1, 1948) • net schedule 2-F

BENJAMIN • page 461

(From General Catalog)

"Lite Line 40" Suspension Fittings

for Type A and Type E Systems

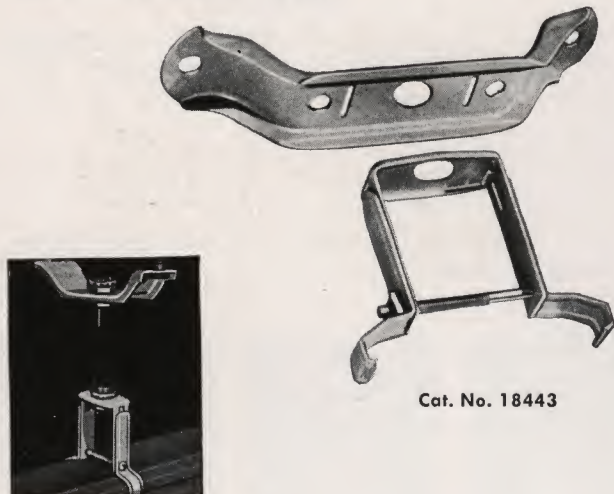
Building construction obstacles, such as beams, skylights, sprinkler heads, cranes, etc., are of little concern when planning a Benjamin "Lite-Line 40" installation, as all channel sections and channel couplings are constructed to permit the use of specially designed sliding hanger type suspension fittings at any point along the line. The sliding hanger suspensions are securely fastened in the desired position by tightening a single nut and bolt, insuring positive attachment to the channel. It is recommended, where possible, to position one sliding hanger at each coupling and one at each end of the fluorescent line.

Illustrated on these pages is a complete line of sliding hanger type suspension fittings available for mounting Benjamin "Lite-Line 40" Systems. While only the most common combinations are listed, other combinations to meet special mounting requirements are possible by combining the various suspension components.

Where a non-sliding type ceiling hanger is desired either the offset ceiling strap, ordinarily used with sliding hanger assemblies, or a flat ceiling strap No. 18432 is available. These straps can be connected directly to convenient knock-outs located in top of the channel sections.

Sliding 1/2-inch Conduit Suspension

Consists of a No. 18441 Offset Ceiling Strap and a No. 18440 Sliding Hanger Assembly.

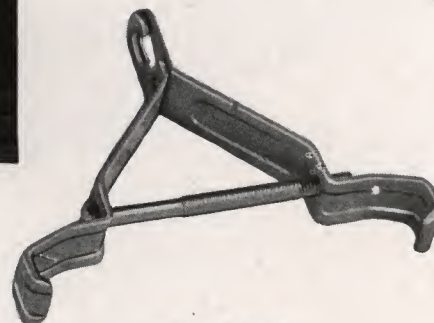


Cat. No. 18443

Description	Cat. No.	List Price
Complete Suspension for 1/2" Conduit*	18443	\$1.10
Suspension Less Ceiling Strap for 1/2" Conduit*	18440	.60
Offset Ceiling Strap Only	18441	.50

*1/2" Conduit not supplied.

Sliding Chain Suspension



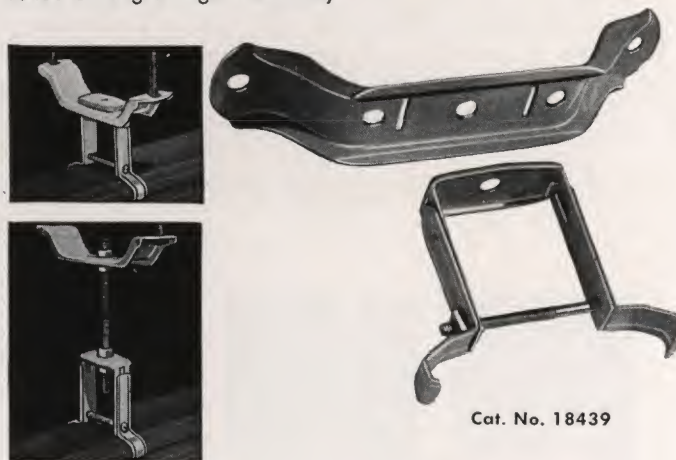
Cat. No. 18450

Description	Cat. No.	List Price
Complete Suspension*	18450	\$0.60

*Chain not supplied. Lock Link chain is recommended.

Sliding 3/8-inch Single-Rod or Sliding Ceiling Suspension

Consists of a No. 18431 Offset Ceiling Strap and a No. 18430 Sliding Hanger Assembly.



Cat. No. 18439

Description	Cat. No.	List Price
Complete Suspension—3/8" Rod or Ceiling*	18439	\$1.10
Suspension Less Ceiling Strap for 3/8" Rod*	18430	.60
Offset Ceiling Strap Only	18431	.50

*3/8" Rod not supplied.

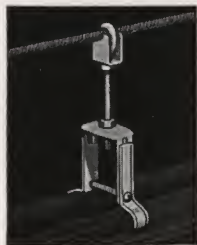
"Lite Line 40" Suspension Fittings

for Type A and Type E Systems

Sliding Messenger Cable Suspension

Consists of a No. 18471 Messenger Cable Hook and a No. 18430 Sliding Hanger Assembly.

Hook fits all cable up to $\frac{3}{8}$ " inclusive, which can be run parallel to or at right angles to channels.



Cat. No. 18472

Description	Cat. No.	List Price
Complete Suspension	18472	\$1.20
Suspension Less Cable Hook	18430	.60
Messenger Cable Hook Only*	18471	.60

*Can be used independently by bolting directly to knockouts provided in top of channel.

Sliding Twin-Rod Suspension

Consists of Two No. 18431 Offset Ceiling Straps and a No. 18430 Sliding Hanger Assembly.



Cat. No. 18438

Description	Cat. No.	List Price
Complete Suspension*	18438	\$1.60
Suspension Less Ceiling Strap*	18430	.60
Offset Ceiling Strap Only	18431	.50

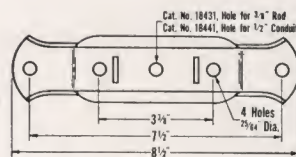
*Rods not supplied.

Offset Ceiling Strap

Can be used independently where a sliding hanger type suspension is not required.



Cat. No. 18431



Description	Cat. No.	List Price
With Center Hole for $\frac{1}{2}$ " Conduit	18441	\$0.50
With Center Hole for $\frac{3}{8}$ " Rod or $\frac{5}{16}$ " Bolt	18431*	.50

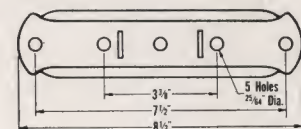
* $\frac{5}{16}$ " nut and bolt supplied.

Flat Ceiling Strap

Can be used independently where a sliding hanger type suspension is not required.



Cat. No. 18432

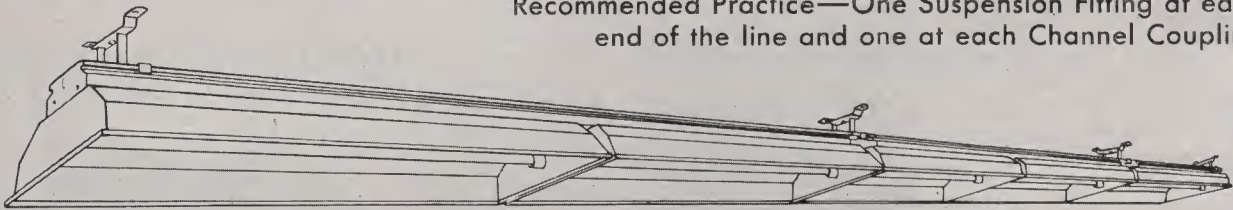


Description	Cat. No.	List Price
Flat Ceiling Strap with center hole for $\frac{3}{8}$ " Rod or $\frac{5}{16}$ " Bolt	18432*	\$0.50

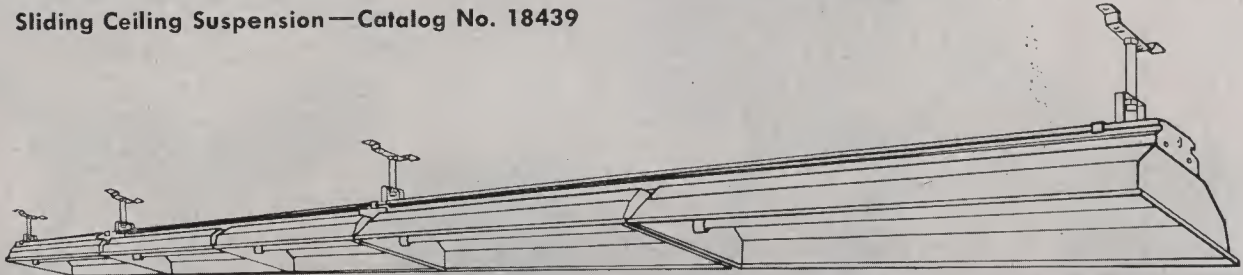
* $\frac{5}{16}$ " nut and bolt supplied.

"Lite-Line 40" Sliding Hanger Suspensions

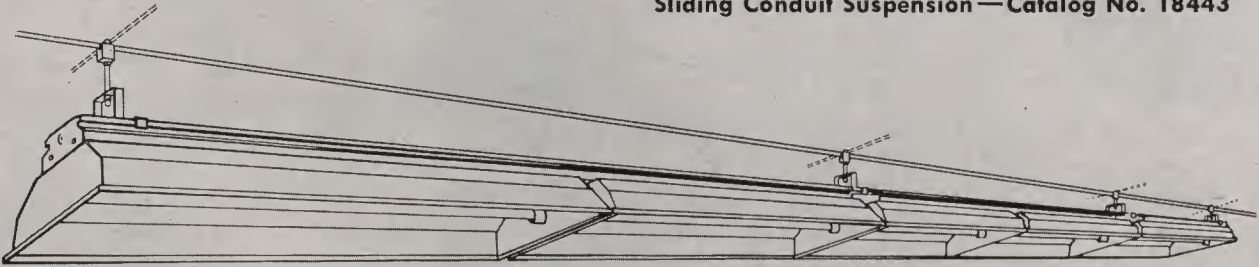
Recommended Practice—One Suspension Fitting at each end of the line and one at each Channel Coupling



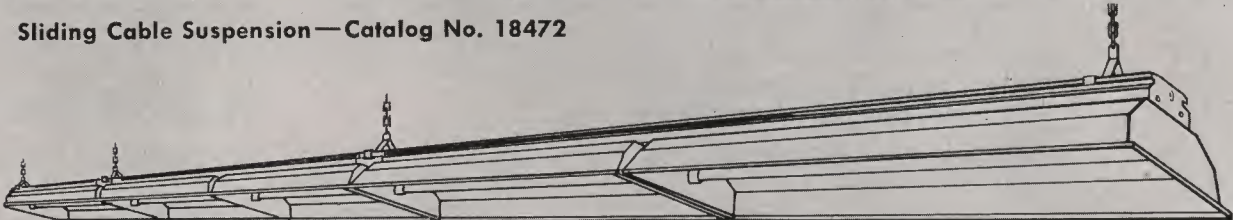
Sliding Ceiling Suspension—Catalog No. 18439



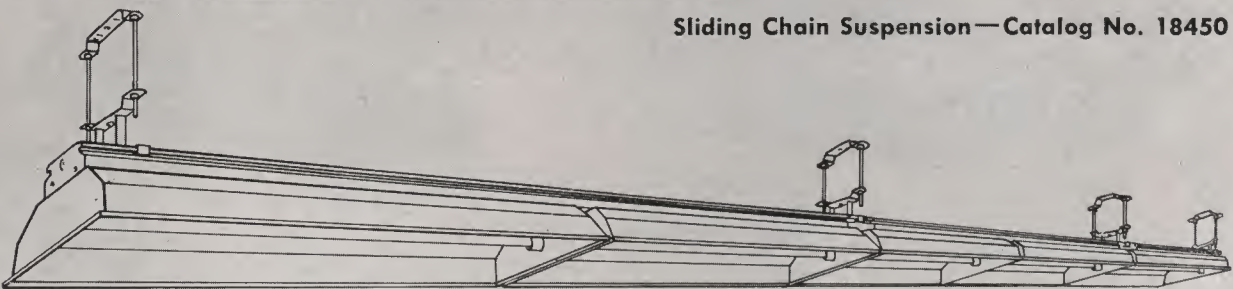
Sliding Conduit Suspension—Catalog No. 18443



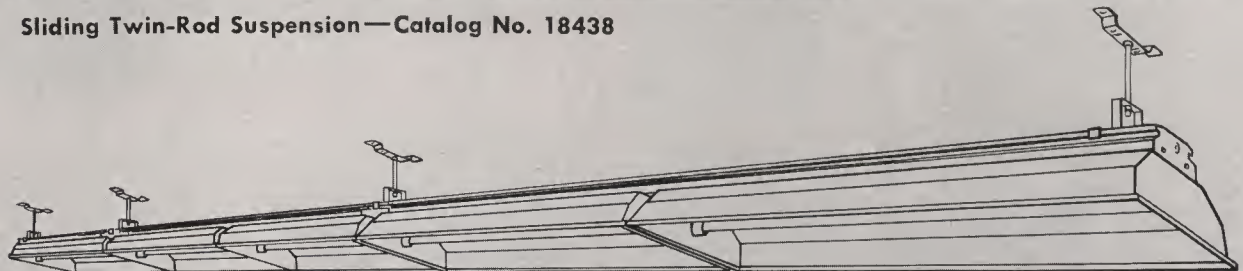
Sliding Cable Suspension—Catalog No. 18472



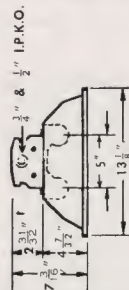
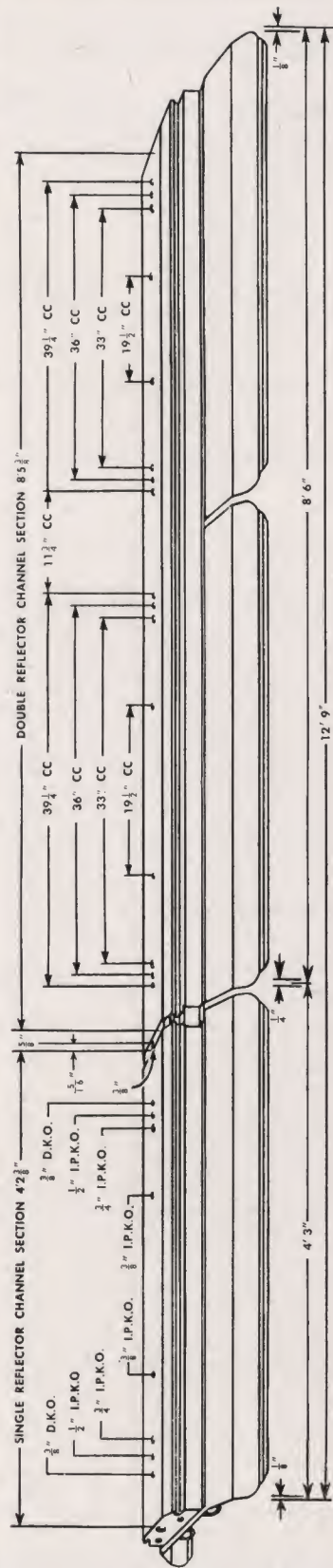
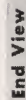
Sliding Chain Suspension—Catalog No. 18450



Sliding Twin-Rod Suspension—Catalog No. 18438

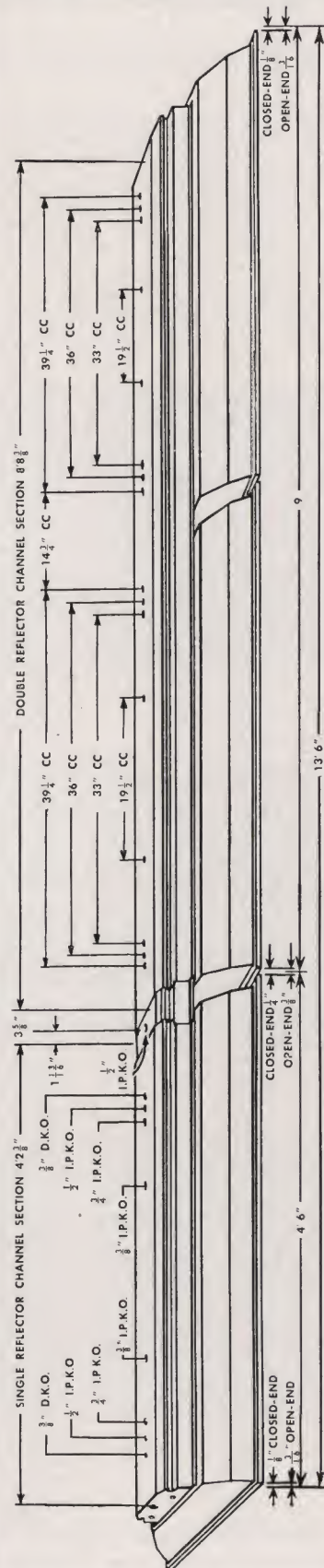
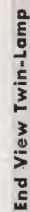
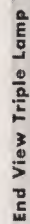


Sliding Single-Rod Suspension—Catalog No. 18439

[illegible]

**for Twin or Triple Lamp,
Closed or Open-end (13³/₈-inch Width) Reflectors**

Closed-end reflectors are $\frac{1}{8}$ -inch longer than the Open-end type. Closed-end reflectors provide $\frac{1}{4}$ -inch spacing between reflectors; Open-end reflectors provide $\frac{3}{8}$ -inch spacing between reflectors.)



Type A Twin-Lamp "Lite-Line 40" Systems

for No. 8452 Open-end 11 1/2-inch Width Reflectors — 3 1/2-inch Lamp Centers

COMPONENT PARTS FOR

Space Available or Length of Line Desired	Nearest Obtainable Length of "Lite-Line" (Overall Dimensions Including Reflectors)	Total Number of Channel Sections, Couplings and End Caps Necessary for a Desired Length of "Lite-Line"			
		Double Reflector Channel Section* 8' 5 3/8" Long Cat. No. 18154-W List Price \$41.70	Single Reflector Channel Section* 4' 2 3/8" Long Cat. No. 18354-W List Price \$20.40	Channel Coupling Cat. No. 18436 List Price \$0.90	Channel End Cap Cat. No. 18425 List Price \$0.40
5'	4'-3"	...	1	...	2
9'	8'-6"	1	...	...	2
14'	12'-9"	1	1	1	2
18'	17'-0"	2	...	1	2
22'	21'-3"	2	1	2	2
26'	25'-6"	3	...	2	2
31'	29'-9"	3	1	3	2
35'	34'-0"	4	...	3	2
39'	38'-3"	4	1	4	2
43'	42'-6"	5	...	4	2
48'	46'-9"	5	1	5	2
52'	51'-0"	6	...	5	2
56'	55'-3"	6	1	6	2
60'	59'-6"	7	...	6	2
65'	63'-9"	7	1	7	2
69'	68'-0"	8	...	7	2
73'	72'-3"	8	1	8	2
77'	76'-6"	9	...	8	2
82'	80'-9"	9	1	9	2
86'	85'-0"	10	...	9	2
90'	89'-3"	10	1	10	2
94'	93'-6"	11	...	10	2
99'	97'-9"	11	1	11	2
103'	102'-0"	12	...	11	2
107'	106'-3"	12	1	12	2
111'	110'-6"	13	...	12	2
116'	114'-9"	13	1	13	2
120'	119'-0"	14	...	13	2
124'	123'-3"	14	1	14	2
128'	127'-6"	15	...	14	2
133'	131'-9"	15	1	15	2
137'	136'-0"	16	...	15	2
141'	140'-3"	16	1	16	2
145'	144'-6"	17	...	16	2
150'	148'-9"	17	1	17	2
154'	153'-0"	18	...	17	2
158'	157'-3"	18	1	18	2
162'	161'-6"	19	...	18	2
167'	165'-9"	19	1	19	2
171'	170'-0"	20	...	19	2
175'	174'-3"	20	1	20	2
179'	178'-6"	21	...	20	2
184'	182'-9"	21	1	21	2
188'	187'-0"	22	...	21	2
192'	191'-3"	22	1	22	2
196'	195'-6"	23	...	22	2
201'	199'-9"	23	1	23	2
205'	204'-0"	24	...	23	2
209'	208'-3"	24	1	24	2
213'	212'-6"	25	...	24	2

Note: For longer installations combine figures in table, or divide desired length of line by 4.26 to obtain number of reflectors required. Couplings required will always be one less than number of channels used.

*With FS40 Non-Blinking Starters; for FS4 Starters see page 456.

BENJAMIN • page 466

net schedule 2-F • (Issued November 1, 1948)

(From General Catalog)

Type A Twin-Lamp "Lite-Line 40" Systems

for No. 8452 Open-end 11 1/2-inch Width Reflectors — 3 1/2-inch Lamp Centers

ORDERING COMPLETE LINES

Total Number of Reflectors Necessary for a Desired Length of "Lite-Line"	Quantity of Suspension Fittings Recommended (Suspension fittings illustrated at right)
RLM Open-end Reflector (11 1/2" Width) Cat. No. 8452 List Price \$7.20	
1	2
2	2
3	3
4	3
5	4
6	4
7	5
8	5
9	6
10	6
11	7
12	7
13	8
14	8
15	9
16	9
17	10
18	10
19	11
20	11
21	12
22	12
23	13
24	13
25	14
26	14
27	15
28	15
29	16
30	16
31	17
32	17
33	18
34	18
35	19
36	19
37	20
38	20
39	21
40	21
41	22
42	22
43	23
44	23
45	24
46	24
47	25
48	25
49	26
50	26

HOW TO USE CHART—Consult first column of adjoining chart and follow down to nearest figure applying. Then follow across succeeding columns horizontally to determine the actual length of line that will fit into the available space, and the number of consisting parts required for making up the line.

Order the number of consisting parts required by the catalog number given at the head of each column.

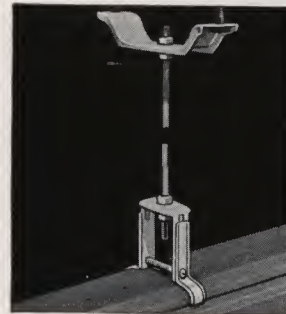
Specify type of suspension fitting desired by catalog number listed below. For additional methods of suspension see pages 462 and 463.



*Stationary Ceiling Strap
Cat. No. 18431
List Price \$0.50



*Sliding Ceiling Suspension
Cat. No. 18439†
List Price \$1.10



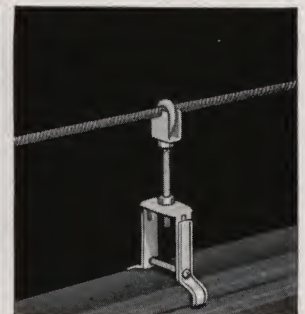
*Sliding 3/8" Rod Suspension
Cat. No. 18439†
List Price \$1.10



*Sliding 1/2" Conduit Suspension
Cat. No. 18443
List Price \$1.10



*Sliding Chain Suspension
Cat. No. 18450
List Price \$0.60



*Sliding Cable Suspension
Cat. No. 18472
List Price \$1.20

*Lag Screws, Rod, Conduit, Chain and Cable not supplied.
†No. 18439 is for either 3/8" Single Rod or Sliding Ceiling Suspension.

Type E Twin-Lamp "Lite-Line 40" Systems

for No. 8462 Closed-end or No. 8453 Open-end 13 1/8-inch Width Reflectors
5-inch Lamp Centers

COMPONENT PARTS FOR

Space Available or Length of Line Desired	Nearest Obtainable Length of "Lite-Line" (Overall Dimensions Including Reflectors)	Total Number of Channel Sections, Couplings and End Caps Necessary for a Desired Length of "Lite-Line"			
		Double Reflector Channel Section* 8' 8 3/8" Long Cat. No. 18854-W List Price \$42.30	Single Reflector Channel Section* 4' 2 3/8" Long Cat. No. 18454-W List Price \$20.60	Channel Coupling Cat. No. 18426 List Price \$1.10	Channel End Cap Cat. No. 18425 List Price \$0.40
6'	4'-6"	...	1	...	2
10'	9'-0"	1	...	...	2
15'	13'-6"	1	1	1	2
19'	18'-0"	2	...	1	2
24'	22'-6"	2	1	2	2
28'	27'-0"	3	...	2	2
33'	31'-6"	3	1	3	2
37'	36'-0"	4	...	3	2
42'	40'-6"	4	1	4	2
46'	45'-0"	5	...	4	2
51'	49'-6"	5	1	5	2
55'	54'-0"	6	...	5	2
60'	58'-6"	6	1	6	2
64'	63'-0"	7	...	6	2
69'	67'-6"	7	1	7	2
73'	72'-0"	8	...	7	2
78'	76'-6"	8	1	8	2
82'	81'-0"	9	...	8	2
87'	85'-6"	9	1	9	2
91'	90'-0"	10	...	9	2
96'	94'-6"	10	1	10	2
100'	99'-0"	11	...	10	2
105'	103'-6"	11	1	11	2
109'	108'-0"	12	...	11	2
114'	112'-6"	12	1	12	2
118'	117'-0"	13	...	12	2
123'	121'-6"	13	1	13	2
127'	126'-0"	14	...	13	2
132'	130'-6"	14	1	14	2
136'	135'-0"	15	...	14	2
141'	139'-6"	15	1	15	2
145'	144'-0"	16	...	15	2
150'	148'-6"	16	1	16	2
154'	153'-0"	17	...	16	2
159'	157'-6"	17	1	17	2
163'	162'-0"	18	...	17	2
168'	166'-6"	18	1	18	2
172'	171'-0"	19	...	18	2
177'	175'-6"	19	1	19	2
181'	180'-0"	20	...	19	2
186'	184'-6"	20	1	20	2
190'	189'-0"	21	...	20	2
195'	193'-6"	21	1	21	2
199'	198'-0"	22	...	21	2
204'	202'-6"	22	1	22	2
208'	207'-0"	23	...	22	2
213'	211'-6"	23	1	23	2
217'	216'-0"	24	...	23	2
222'	220'-6"	24	1	24	2
226'	225'-0"	25	...	24	2

Note: For longer installations combine figures in table, or divide desired length of line by 4.5 to obtain number of reflectors required. Couplings required will always be one less than number of channels used.

*With FS40 Non-Blinking Starters; for FS4 Starters see page 458.

Type E Twin-Lamp "Lite-Line 40" Systems

for No. 8462 Closed-end or No. 8453 Open-end 13 1/8-inch Width Reflectors
5-inch Lamp Centers

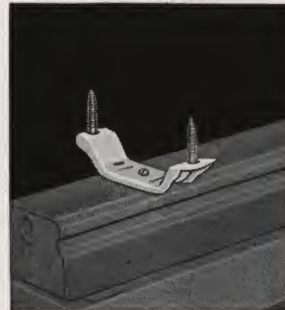
ORDERING COMPLETE LINES

Total Number of Reflectors Necessary for a Desired Length of "Lite-Line" (Select either Closed or Open-end Type)		Quantity of Suspension Fittings Recommended (Suspension fittings illustrated at right)
RLM Closed-end Reflector (13 1/8" Width) Cat. No. 8462 List Price \$12.00	RLM Open-end Reflector (13 1/8" Width) Cat. No. 8453 List Price \$7.60	
1	1	2
2	2	2
3	3	3
4	4	3
5	5	4
6	6	4
7	7	5
8	8	5
9	9	6
10	10	6
11	11	7
12	12	7
13	13	8
14	14	8
15	15	9
16	16	9
17	17	10
18	18	10
19	19	11
20	20	11
21	21	12
22	22	12
23	23	13
24	24	13
25	25	14
26	26	14
27	27	15
28	28	15
29	29	16
30	30	16
31	31	17
32	32	17
33	33	18
34	34	18
35	35	19
36	36	19
37	37	20
38	38	20
39	39	21
40	40	21
41	41	22
42	42	22
43	43	23
44	44	23
45	45	24
46	46	24
47	47	25
48	48	25
49	49	26
50	50	26

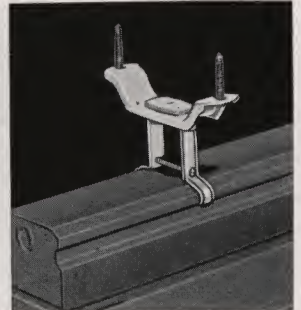
HOW TO USE CHART—Consult first column of adjoining chart and follow down to nearest figure applying. Then follow across succeeding columns horizontally to determine the actual length of line that will fit into the available space, and the number of consisting parts required for making up the line.

Order the number of consisting parts required by the catalog number given at the head of each column.

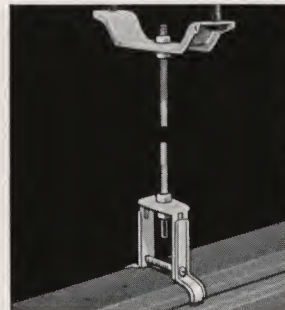
Specify type of suspension fitting desired by catalog number listed below. For additional methods of suspension see pages 462 and 463.



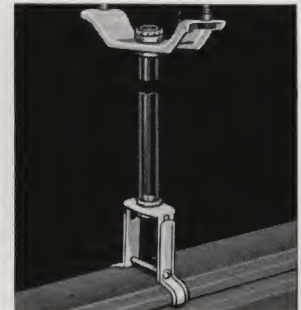
*Stationary Ceiling Strap
Cat. No. 18431
List Price \$0.50



*Sliding Ceiling Suspension
Cat. No. 18439†
List Price \$1.10



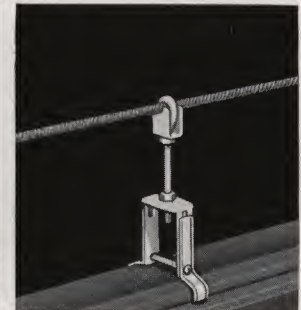
*Sliding 3/8" Single Rod Suspension
Cat. No. 18439†
List Price \$1.10



*Sliding 1/2" Conduit Suspension
Cat. No. 18443
List Price \$1.10



*Sliding Chain Suspension
Cat. No. 18450
List Price \$0.60



*Sliding Cable Suspension
Cat. No. 18472
List Price \$1.20

*Lag Screws, Rod, Conduit, Chain and Cable not supplied.
†No. 18439 is for either 3/8" Single Rod or Sliding Ceiling Suspension.

Type E Triple-Lamp "Lite-Line 40" Systems

for No. 8462 Closed-end or No. 8453 Open-end 13 1/8-inch Width Reflectors
2 1/2-inch Lamp Centers

COMPONENT PARTS FOR

Space Available or Length of Line Desired	Nearest Obtainable Length of "Lite-Line" (Overall Dimensions Including Reflectors)	Total Number of Channel Sections, Couplings and End Caps Necessary for a Desired Length of "Lite-Line"			
		Double Reflector Channel Section* 8' 8 3/4" Long Cat. No. 18857-W List Price \$61.40	Single Reflector Channel Section* 4' 2 3/8" Long Cat. No. 18457-W List Price \$31.30	Channel Coupling Cat. No. 18426 List Price \$1.10	Channel End Cap Cat. No. 18425 List Price \$0.40
6'	4'-6"	...	1	...	2
10'	9'-0"	1	...	...	2
15'	13'-6"	1	1	1	2
19'	18'-0"	2	...	1	2
24'	22'-6"	2	1	2	2
28'	27'-0"	3	...	2	2
33'	31'-6"	3	1	3	2
37'	36'-0"	4	...	3	2
42'	40'-6"	4	1	4	2
46'	45'-0"	5	...	4	2
51'	49'-6"	5	1	5	2
55'	54'-0"	6	...	5	2
60'	58'-6"	6	1	6	2
64'	63'-0"	7	...	6	2
69'	67'-6"	7	1	7	2
73'	72'-0"	8	...	7	2
78'	76'-6"	8	1	8	2
82'	81'-0"	9	...	8	2
87'	85'-6"	9	1	9	2
91'	90'-0"	10	...	9	2
96'	94'-6"	10	1	10	2
100'	99'-0"	11	...	10	2
105'	103'-6"	11	1	11	2
109'	108'-0"	12	...	11	2
114'	112'-6"	12	1	12	2
118'	117'-0"	13	...	12	2
123'	121'-6"	13	1	13	2
127'	126'-0"	14	...	13	2
132'	130'-6"	14	1	14	2
136'	135'-0"	15	...	14	2
141'	139'-6"	15	1	15	2
145'	144'-0"	16	...	15	2
150'	148'-6"	16	1	16	2
154'	153'-0"	17	...	16	2
159'	157'-6"	17	1	17	2
163'	162'-0"	18	...	17	2
168'	166'-6"	18	1	18	2
172'	171'-0"	19	...	18	2
177'	175'-6"	19	1	19	2
181'	180'-0"	20	...	19	2
186'	184'-6"	20	1	20	2
190'	189'-0"	21	...	20	2
195'	193'-6"	21	1	21	2
199'	198'-0"	22	...	21	2
204'	202'-6"	22	1	22	2
208'	207'-0"	23	...	22	2
213'	211'-6"	23	1	23	2
217'	216'-0"	24	...	23	2
222'	220'-6"	24	1	24	2
226'	225'-0"	25	...	24	2

Note: For longer installations combine figures in table, or divide desired length of line by 4.5 to obtain number of reflectors required. Couplings required will always be one less than number of channels used.

*With FS40 Non-Blinking Starters; for FS4 Starters see page 460.

Type E Triple-Lamp "Lite-Line 40" Systems

for No. 8462 Closed-end or No. 8453 Open-end 13 1/8-inch Width Reflectors
2 1/2-inch Lamp Centers

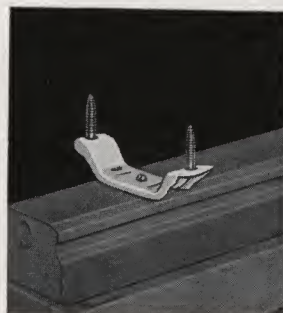
ORDERING COMPLETE LINES

Total Number of Reflectors Necessary for a Desired Length of "Lite-Line" (Select either Closed or Open-end Type)		Quantity of Suspension Fittings Recommended (Suspension fittings illustrated at right)
RLM Closed-end Reflector (13 1/8" Width) Cat. No. 8462 List Price \$12.00	RLM Open-end Reflector (13 1/8" Width) Cat. No. 8453 List Price \$7.60	
1	1	2
2	2	2
3	3	3
4	4	3
5	5	4
6	6	4
7	7	5
8	8	5
9	9	6
10	10	6
11	11	7
12	12	7
13	13	8
14	14	8
15	15	9
16	16	9
17	17	10
18	18	10
19	19	11
20	20	11
21	21	12
22	22	12
23	23	13
24	24	13
25	25	14
26	26	14
27	27	15
28	28	15
29	29	16
30	30	16
31	31	17
32	32	17
33	33	18
34	34	18
35	35	19
36	36	19
37	37	20
38	38	20
39	39	21
40	40	21
41	41	22
42	42	22
43	43	23
44	44	23
45	45	24
46	46	24
47	47	25
48	48	25
49	49	26
50	50	26

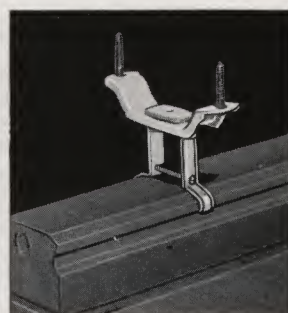
HOW TO USE CHART—Consult first column of adjoining chart and follow down to nearest figure applying. Then follow across succeeding columns horizontally to determine the actual length of line that will fit into the available space, and the number of consisting parts required for making up the line.

Order the number of consisting parts required by the catalog number given at the head of each column.

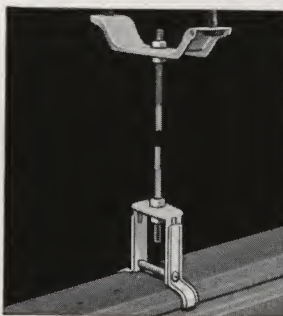
Specify type of suspension fitting desired by catalog number listed below. For additional methods of suspension see pages 462 and 463.



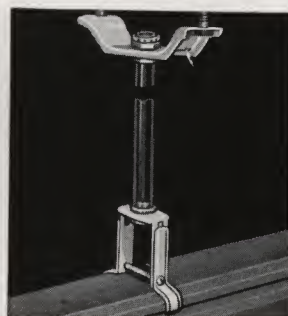
*Stationary Ceiling Strap
Cat. No. 18431
List Price \$0.50



*Sliding Ceiling Suspension
Cat. No. 18439†
List Price \$1.10



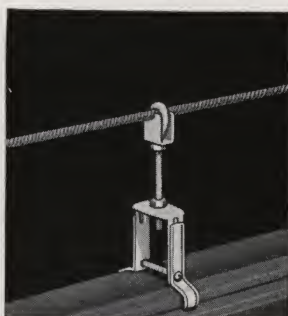
*Sliding 3/8" Single Rod Suspension
Cat. No. 18439†
List Price \$1.10



*Sliding 1/2" Conduit Suspension
Cat. No. 18443
List Price \$1.10



*Sliding Chain Suspension
Cat. No. 18450
List Price \$0.60



*Sliding Cable Suspension
Cat. No. 18472
List Price \$1.20

*Lag Screws, Rod, Conduit, Chain and Cable not supplied.
†No. 18439 is for either 3/8" Single Rod or Sliding Ceiling Suspension.

Simplified Lighting Data

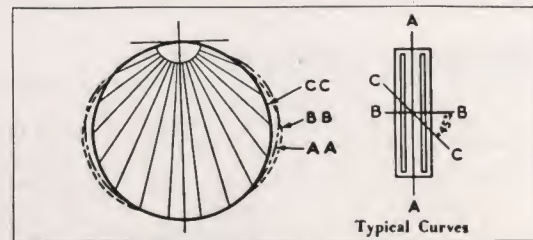
on Twin and Triple-Lamp "Lite-Line 40" Systems

Tables below are based on 40-watt (48-inch) 3500° "white" Mazda Fluorescent Lamps, 2300 lumens. (For 4500° "white" lamps, 2100 lumens, multiply values by .91; For 6500° "daylight" lamps, 1920 lumens, multiply values by .835). Mounting heights are distance above floor; footcandle values are on working plane 30 inches above floor. Maintenance factor is .75.

For number of reflectors required for a given footcandle value, divide area of room by "area lighted per reflector." Then multiply the number of reflectors in the line by the number of rows as spaced.

Lighting Data based on the following formula:

$$\text{Lamp Lumens Required} = \frac{\text{Footcandles} \times \text{Area of Room}}{\text{Coefficient of Utilization} \times \text{Maintenance Factor}}$$



RLM "Lite-Line 40" Reflectors with 2 "White" Lamps of 2300 Lumens Each

The following data applies to Type A Twin-lamp Open-end Reflectors, and Type E Twin-lamp Closed or Open-end Reflectors.

Spacing of rows	Mounting height above floor	Area (Sq. Ft.) Per Reflector		Room† Conditions	ROOM PROPORTIONS** Average Footcandles on Horizontal					
		Type "A"	Type "E"		Type "A"†	Type "E"	Type "A"†	Type "E"	Type "A"†	Type "E"
6'-0"	6'-6"	25.5	27.0	very light	95-104	90-98	77-87	73-82	51-68	48-64
				fairly light	91-98	86-93	73-82	69-77	43-60	41-57
				fairly dark	87-95	82-90	64-77	60-73	37-51*	35-48*
				very light	81-88	77-83	67-74	63-70	44-59	42-56
				fairly light	77-83	73-79	63-69	59-65	37-51	35-49
				fairly dark	74-81	70-77	56-67	53-63	33-44*	31-42*
7'-0"	7'-6"	29.8	31.5	very light	71-79	67-74	58-63	55-59	38-51	36-48
				fairly light	68-73	64-69	56-61	53-58	33-45	31-43
				fairly dark	63-71	59-67	49-58	46-55	28-38*	26-36*
8'-0"	8'-0"	34.0	36.0	very light	57-62	54-59	46-52	44-49	31-40	29-38
				fairly light	54-59	52-56	44-49	42-46	26-36	24-34
				fairly dark	52-57	49-54	38-46	36-44	23-31*	21-29*
10'-0"	9'-6"	42.5	45.0	very light	48-52	45-49	38-43	36-41	25-34	23-32
				fairly light	45-49	43-46	36-40	34-38	22-31	21-29
				fairly dark	43-48	41-45	32-38	30-36	20-25*	19-23*
12'-0"	10'-6"	51.0	54.0	very light	37-41	35-39	31-35	29-33	21-26	20-25
				fairly light	36-39	34-37	29-33	27-31	17-24	16-22
				fairly dark	34-37	32-35	26-31	24-29	15-21*	14-1-20*
15'-0"	12'-6"	63.7	67.5	very light	32-34	30-32	26-29	24-27	17-23	16-21
				fairly light	31-33	29-31	25-27	23-25	14-5-21	13-7-20
				fairly dark	29-32	27-30	22-26	20-24	12-5-17*	11-8-16*

RLM "Lite-Line 40" Reflectors with 3 "White" Lamps of 2300 Lumens Each

The following data applies to Type E Triple-lamp Closed or Open-end Reflectors.

6'-0"	6'-6"	27.0	very light	127-139	103-117	68-92
			fairly light	122-132	99-110	58-81
			fairly dark	117-127	87-103	52-68*
			very light	109-120	90-99	59-78
			fairly light	104-113	85-94	50-69
			fairly dark	100-109	74-90	44-59*
7'-0"	7'-6"	31.5	very light	96-104	78-88	52-68
			fairly light	91-99	74-82	44-60
			fairly dark	88-96	65-78	38-52*
8'-0"	8'-0"	36.0	very light	76-83	62-70	41-55
			fairly light	73-79	59-65	35-48
			fairly dark	69-76	53-62	31-41*
10'-0"	9'-6"	45.0	very light	63-69	53-59	34-46
			fairly light	60-66	49-55	29-41
			fairly dark	59-63	43-53	25-34*
12'-0"	10'-6"	54.0	very light	51-56	42-47	27-36
			fairly light	49-53	40-44	23-32
			fairly dark	47-51	34-42	20-27*
15'-0"	12'-6"	67.5	very light	38-42	31-35	20-27
			fairly light	36-40	30-33	18-24
			fairly dark	35-38	25-31	16-20*
20'-0"	15'-6"	90.0	very light	30-33	24-27	17-21
			fairly light	29-32	23-25	13-9-20
			fairly dark	27-30	20-24	12-2-17*

*IMPRACTICAL—It is recommended that interior room conditions be improved or provision made for more frequent maintenance.

†ROOM CONDITIONS—To determine conditions of walls and ceilings consult chart on page 18, Benjamin Catalog No. 26.

**ROOM PROPORTIONS—Use "Favorable" for broad rooms where width is about four times mounting height above floor.

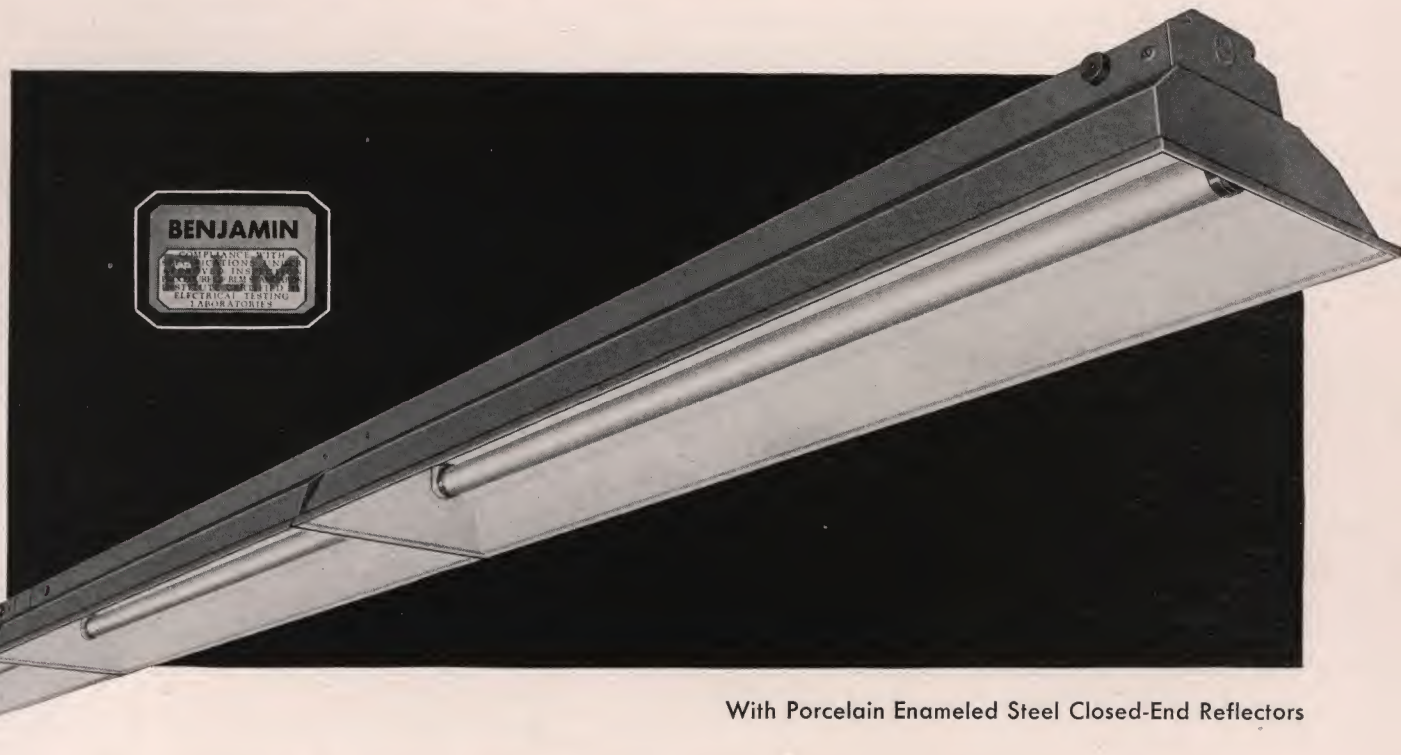
Use "Average" where room width is about twice the mounting height above floor.

Use "Unfavorable" for narrow rooms where width is about equal to mounting height above floor.

† The higher footcandles given for Type "A" units are due to greater numbers of units per given length of "Lite-Line".

Benjamin RLM "Lite-Line 100" System

RLM 85 or 100-Watt Fluorescent Systems for Continuous Line Installation



With Porcelain Enameled Steel Closed-End Reflectors

This Benjamin RLM "Lite-Line 100" System, designed for two 85-watt (60-inch) fluorescent lamps or two 100-watt (60-inch) fluorescent lamps, provides continuous lines of high intensity illumination.

With this system it is possible to most effectively utilize the maximum amount of available floor space and to obtain 45 to 125 footcandles of illumination on the working plane when installed at normal spacing. Moreover, this system provides adequate levels of illumination where conditions require fairly high mounting and wide spacing.

The basis of this continuous line, fluorescent system is a double reflector, twin lamp, steel channel section together with closed-end or open-end porcelain enameled reflectors. Standard single reflector channel sections are also available to fill out the ends of a "Lite-Line 100" System where the double channel would be too long.

The channel sections form a continuous wireway enclosure when joined end to end by means of rigid channel couplings. Exposed ends of channel sections at each end of the line are closed by easily attachable end caps. As a greater part of the branch circuit wiring is carried within the channel, much of the usual expenditures for conduit, outlet boxes and fittings are eliminated, resulting in 25 to 40% savings in installation cost. Moreover, much of the needless expense of

hanging individual units on separate stems and the necessity of relocating outlets is eliminated by having the reflectors grouped together on a single continuous channel which can be installed as a unit and mounted by means of the available sliding hanger type suspensions.

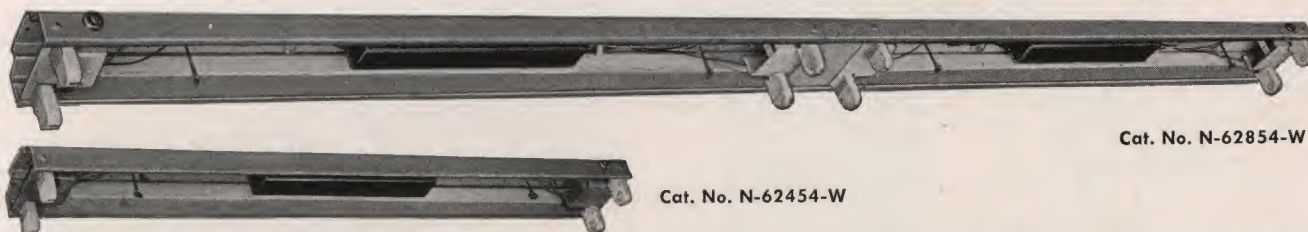
Ruggedly constructed, heavy gauge steel channels, finished with gray, baked enamel, and steel reflectors, finished with Benjamin "lifetime" porcelain enamel, insure long, dependable service. Skillful engineering and precision manufacturing methods insure correct reflector contour, adequate shielding of lamps, and maximum light output.

Separable Construction—The heavy duty porcelain enameled steel reflectors are easily and quickly removed from the rugged steel channels by a quarter turn of two adjustable hand-operated "Lok-Latch" reflector fasteners. Ballast and lampholders are assembled to the steel channel so that by simply removing the lamps, and turning the "Lok-Latch" fasteners the reflector may be easily and quickly removed for cleaning or for inspection of wiring.

In installing, the channels are mounted first and all necessary wiring connections completed. After that it is only a simple mechanical connection to attach the reflector to the channel using the "Lok-Latch" reflector fasteners.

"Lite-Line 100" Channel Sections

Twin-Lamp, Single and Double Channel Sections for use with Closed-end and Open-end Reflectors Listed on page 372



Cat. No. N-62854-W

Cat. No. N-62454-W

These twin-lamp, single and double reflector channel sections, for use in building up "Lite-Line 100" Systems, may be suspended by either the sliding hanger type suspension fittings listed on page 373 or by rigid conduit, using knock-outs provided in the top of the channel.

Channels do not include end caps, No. 18625, which must be ordered separately.

They are complete with ballasts, lampholders, starter receptacles and starters, unless otherwise indicated in the listings. Channel sections with twin-lamp ballasts are wired with 6-inch leads. Sections with four-lamp, sequence starting ballasts and sections without ballasts have sufficient lead wire to complete connections at time of installation. For complete specifications, see page 370.

SINGLE REFLECTOR CHANNEL SECTIONS (5' 1-7/16" long) WITHOUT END CAPS

With Conventional Ballasts and Standard (FS-64) Starters (For 85 or 100-watt lamps)

Line Voltage† 60 Cycles*	No. of Lamps	Ballast Equipment (95% Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price
110-125 V.	2	1 Twin-Lamp	25	N-62454	\$37.50
220-250 V.	2	1 Twin-Lamp	25	N-62456	37.50

With Conventional Ballasts and Manual Reset, Nonblinking (FS-850) Starters (For 85 or 100-watt lamps)

110-125 V.	2	1 Twin-Lamp	25	N-62454-W	\$38.30
220-250 V.	2	1 Twin-Lamp	25	N-62456-W	38.30

DOUBLE REFLECTOR CHANNEL SECTIONS (10' 6-13/16" long)—WITHOUT END CAPS

With Conventional Ballasts and Standard (FS-64) Starters (For 85 or 100-watt lamps)

Line Voltage† 60 Cycles*	No. of Lamps	Ballast Equipment (95% Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price
110-125 V.	4	2 Twin-Lamp	52	N-62854	\$75.20
220-250 V.	4	2 Twin-Lamp	52	N-62856	75.20

With Conventional Ballasts and Manual Reset, Nonblinking (FS-850) Starters (For 85 or 100-watt lamps)

110-125 V.	4	2 Twin-Lamp	52	N-62854-W	\$76.80
220-250 V.	4	2 Twin-Lamp	52	N-62856-W	76.80

With Sequence Starting Ballast and Standard (FS-64) Starters (For 85 or 100-watt lamps)

250-280 V.	4	1 Four-Lamp	41	N-62858	\$52.60
------------	---	-------------	----	---------	---------

With Sequence Starting Ballasts and Manual Reset, Nonblinking (FS-850) Starters (For 85 or 100-watt lamps)

250-280 V.	4	1 Four-Lamp	41	N-62858-W	\$54.20
------------	---	-------------	----	-----------	---------

‡Half-Blank Channel with Conventional Ballasts and Standard (FS-64) Starters (For 85 or 100-watt lamps)

110-125 V.	2	1 Twin-Lamp (No ballast, starters or lamp holders in blank half)	37	N-62894	\$45.10
220-250 V.	2	1 Twin-Lamp (No ballast, starters or lamp holders in blank half)	37	N-62896	45.10

‡Half-Blank Channel with Conventional Ballasts and Manual Reset, Nonblinking (FS-850) Starters (For 85 or 100-watt lamps)

110-125 V.	2	1 Twin-Lamp (No ballast, starters or lamp holders in blank half)	37	N-62894-W	\$45.90
220-250 V.	2	1 Twin-Lamp (No ballast, starters or lamp holders in blank half)	37	N-62896-W	45.90

‡BLANK CHANNEL SECTIONS AND BLANK CHANNEL COVER

Description	Net Wt. Lbs. Ea.	Cat. No.	List Price
Single Blank Channel Section	10	N-62410	\$ 7.40
Double Blank Channel Section	22	N-62810	15.00
Blank Channel Cover only	6	N-62401	2.60

* 50 cycle ballast units supplied; prices quoted upon application.

† Units supplied with 199-216 or 240-280 volt conventional type ballast at 220-250 volt conventional type ballast prices.

‡ Half-Blank and Blank Channel Sections are used for making various Skip-Section "Lite-Line" arrangements. In blank sections of half-blank channels and in single and double blank channels, control equipment and lampholders have been omitted. They can be added later. Channels do not include blank channel cover, No-62401, which must be ordered separately—one for each reflector omitted.

Porcelain Enamel Channels—Available for use in damp locations. Complete details and prices are available upon application. Lamps not supplied.

"Lite-Line 100" Reflectors and Parts

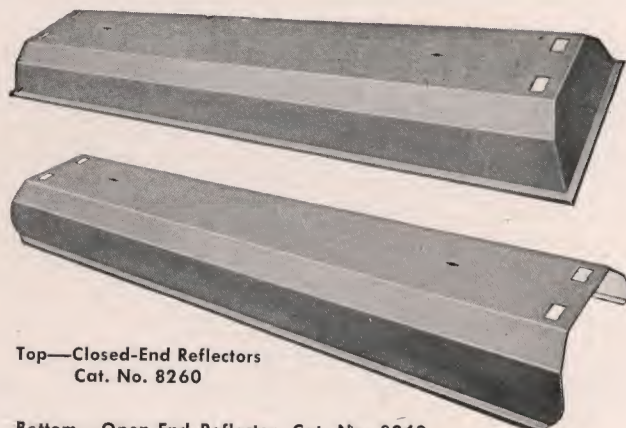
for use with Channel Sections Listed on page 371

RLM Porcelain Enamel Steel Reflectors

The closed-end and open-end RLM Reflectors listed below are for use with channel sections listed on page 371.

Reflectors are made of 20 gauge steel, completely covered with porcelain enamel. Outer surfaces are finished gray and inner reflecting surfaces are finished white with a reflection factor of 82% or more.

Reflectors may be quickly and easily attached to the channel by a quarter turn of two adjustable hand-operated "Lok-Latch" reflector fasteners supplied with the channels. The lamp shielding angle is 14 degrees.



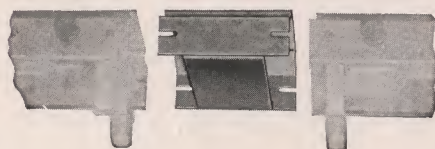
Top—Closed-End Reflectors
Cat. No. 8260

Bottom—Open-End Reflector, Cat. No. 8240

Reflector Type	Dimensions—Inches		Net Wt. Lbs. Each	Cat. No.	List Price
	Width	Length			
Closed-end	16	65¼	18	8260	\$15.60
Open-end	16	65¼	15	8240	10.00

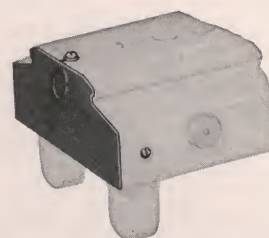
Catalog Number 60902 white paint enameled louver, for use with Cat. No. 8260 reflector, lists at \$11.00.

Channel Coupling and End Cap



Channel Coupling
Cat. No. 18626

Coupling—Couplings for joining channel sections are of 20 gauge steel and are finished in gray enamel. Couplings include two attaching screws and have a ½-inch iron pipe size knockout in top center. Overall length is 6½ inches. Length of exposed portion is 3½ inches.



End Cap Cat. No. 18625

End Cap—Channel End Caps are used at each end of the line for closing the channel sections. They are of 20 gauge steel and finished in gray enamel. They include one screw for attaching. End caps are supplied with a ½-inch iron pipe size knockout.

Description	Net Wt. Lbs. Each	Cat. No.	List Price
Coupling	2	18626	\$1.10
End Cap	½	18625	.50

"Lite-Line 100" System Suspension Fittings

Sliding Hanger Type

Illustrated below is a complete line of sliding hanger type suspension fittings available for mounting Benjamin "Lite-Line 100" Systems.

The suspensions are the same as used with the "Lite-Line 40" Systems and additional information may be found on pages 348 and 349.

Where a non-sliding type ceiling hanger is desired the offset ceiling strap No. 18431 or the flat ceiling strap No. 18432 (page 349) is available.

Sliding Messenger Cable Suspension

Consists of No. 18471 Messenger Cable Hook and a No. 18420 Sliding Hanger Assembly.

Hook fits all cable up to 7/16" inclusive, which can be run parallel to or at right angles to channels.



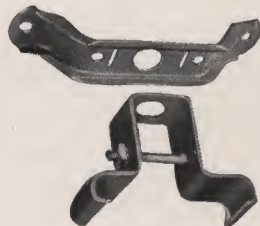
Cat. No. 18472

Description	Cat. No.	List Price
Complete Suspension	18472	\$1.20
Suspension Less Cable Hook	18420	.60
Messenger Cable Hook Only*	18471	.60

*Can be used independently by bolting directly to 1/2-inch diameter knockouts provided in top of channel.

Sliding 1/2-Inch Conduit Suspension

Consists of a No. 18441 Offset Ceiling Strap and a No. 18415 Sliding Hanger Assembly.

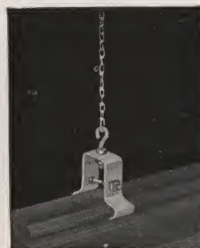


Cat. No. 18443

Description	Cat. No.	List Price
Complete Suspension for 1/2" Conduit*	18443	\$1.10
Suspension Less Ceiling Strap for 1/2" Conduit*	18415	.60
Offset Ceiling Strap Only	18441	.50

*1/2" Conduit not supplied.

Sliding Chain Suspension



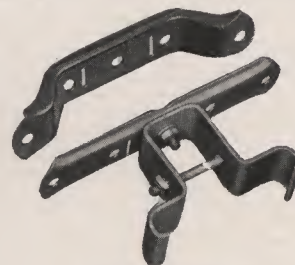
Cat. No. 18449

Description	Cat. No.	List Price
Complete Suspension*	18449	\$0.75
Hook Assembly Only	18448	.15
Suspension Less Hook	18420	.60

*Chain not supplied. Lock link Chain is recommended.

Sliding Twin-Rod Suspension and Sliding Ceiling Suspension

Consists of One No. 18431 Offset Ceiling Strap, One No. 18432 Flat Ceiling Strap and a No. 18420 Sliding Hanger.



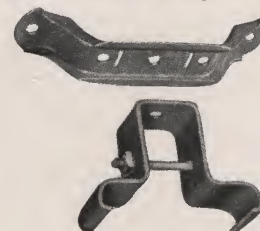
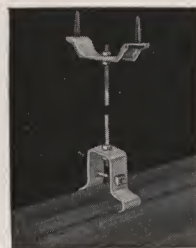
Cat No. 18422

Description	Cat. No.	List Price
Complete Twin-Rod Suspension*	18422	\$1.60
Complete Ceiling Suspension	18423	1.10
Suspension Less Ceiling Strap*	18420	.60
Offset Ceiling Strap Only	18431	.50
Flat Ceiling Strap with 5/16" Center Hole	18432	.50

*Rods not supplied.

Sliding 3/8-Inch Single-Rod

Consists of No. 18431 Strap and No. 18420 Hanger.



Cat. No. 18439

Description	Cat. No.	List Price
Complete Suspension—3/8" Rod or Ceiling*	18439	\$1.10
Suspension Less Ceiling Strap for 3/8" Rod*	18420	.60
Offset Ceiling Strap Only	18431	.50

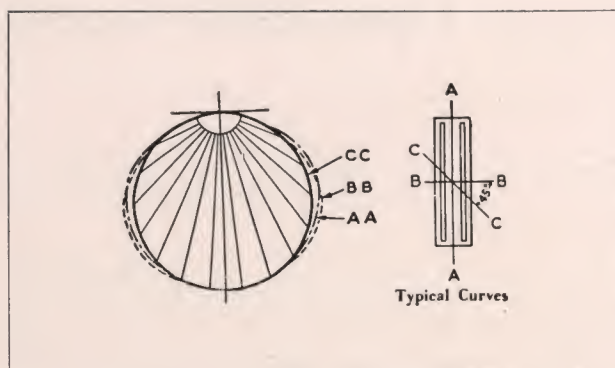
*3/8" Rod not supplied.

Simplified Lighting Data

on Twin-Lamp "Lite-Line 100" System

Tables below are based on 85-watt or 100-watt (60-inch) 3500 degree "white" fluorescent lamps with output of 4200 lumens each. (For 4500 degree "white" lamps, 4000 lumens each, multiply values by 0.95; For 6500 degree "daylight" lamps, 3900 lumens each, multiply values by 0.93). Mounting heights are distance above floor: Footcandle values are on working plane 30-inches above floor. Values are based on a minimum installation of 4 units and maintenance factor of 75%.

For number of reflectors required for a given footcandle value, divide area of room by "area lighted per reflector." Then multiply the number of reflectors in the line by the number of rows as spaced.



Lighting Data below is based on the following formula:

$$\text{Lamp Lumens Required} = \frac{\text{Footcandle} \times \text{Area of Room}}{\text{Coefficient of Utilization} \times \text{Maintenance Factor}}$$

RLM "Lite-Line 100" Closed-End Reflectors with 2 "White" Lamps of 4200 Lumens Each

Spacing of rows	†Mounting Height Above Floor	Area (Sq. Ft.) Per Reflector	Room‡ Conditions	ROOM PROPORTIONS** Average Footcandles on Horizontal					
6'-0"	6'-6"	32.7	very light fairly light fairly dark	120-127 115-123 111-120	106-118 95-112 87-106	80-95 71-87 64-80*	FAVORABLE	AVERAGE	UNFAVORABLE
7'-0"	7'-6"	38.1	very light fairly light fairly dark	103-109 99-106 96-103	88-101 81-95 75-88	68-81 61-75 55-68*			
8'-0"	8'-0"	43.6	very light fairly light fairly dark	90-96 87-93 84-90	77-88 70-83 65-77	59-70 53-65 47-59*			
10'-0"	9'-6"	54.5	very light fairly light fairly dark	72-77 69-75 67-72	62-70 57-66 53-62	47-57 42-53 38-47*			
12'-0"	10'-6"	65.4	very light fairly light fairly dark	60-64 58-62 56-60	51-59 47-55 43-51	40-47 36-43 31-40*			
15'-0"	12'-6"	81.6	very light fairly light fairly dark	48-51 46-50 45-48	41-47 38-44 35-41	31-38 28-35 25-31*			
20'-0"	15'-6"	109.0	very light fairly light fairly dark	36-38 35-37 34-36	31-36 28-34 26-31	24-28 21-26 19.1-24*			
25'-0"	19'-0"	136.2	very light fairly light fairly dark	29-30 28-29 27-29	24-38 23-26 21-24	19.2-23 17.2-21 15.2-19.2*			

*IMPRACTICAL—It is recommended that interior room conditions be improved or provision made for more frequent maintenance.

†Minimum heights shown are for spacing ratio of 1½ to 1. The greater heights are for 1 to 1 spacing.

‡ROOM CONDITIONS—To determine condition of walls and ceilings consult Section 1, General Catalog.

**ROOM PROPORTIONS—Use "Favorable" for broad rooms where width is about four times mounting height above floor.

Use "Average" where room width is about twice the mounting height above floor.

Use "Unfavorable" for narrow rooms where width is about equal to mounting height above floor.

bulletin
mf

Lighting Equipment for Slimline Fluorescent Lamps*

*Reprinted from Section 13-a, Benjamin General Catalog

BENJAMIN

● *Lighting Equipment*

index

	page
"Magna-Flo" Individual Units for 96", 72" and 48" Slimline Lamps	374B-1
Accessories for "Magna-Flo" Lighting Equipment	374B-10
"Magna-Flo" Continuous Line Systems for 96", 72" and 48" Slimline Lamps	374C-1
Sliding Hanger Suspension Fittings for "Magna-Flo" Lighting Equipment	374C-8
Numerical Index of Catalog Numbers	374C-9

Two-Lamp, Sequence-Start, Series Type Ballasts Now OPTIONAL for Benjamin 2&3 Lamp "Magna-Flo" Lighting Equipment

Two-lamp, Sequence-Start, Series-Type Ballasts are now available as **OPTIONAL EQUIPMENT** on ALL Benjamin "Magna-Flo" lighting systems (both individual units and continuous line systems for 96, 72, and 48-inch T-12 slim-line lamps).

These ballasts are two-lamp, high power factor type. The suffix *SER* is added to present "Magna-Flo" Catalog Numbers to get new numbers for equipment with series ballasts.* Examples: No. 96502 Channel becomes 96502-SER; No. 72502 Channel becomes 72502-SER; and No. 48103 Unit becomes 48103-SER.

Voltage—Series Ballasts are available for both 110-125V. and 220-250V. operation.

Three-Lamp Equipment — Three-Lamp Equipment under this option will be supplied with a two-lamp Series Ballast plus a single-lamp Lag-Lead Ballast.

RLM Standards—As of October 1, 1951, the two-lamp series ballast, supplied with "Magna-Flo" equipment for 96-inch, T12 slimline lamps, will carry the RLM label.

*See Fluorescent Net Price List for prices.

How Series Ballasts Differ from Lag-Lead Ballasts—

A Sequence-Start Series type ballast has an autotransformer similar to the Lag-Lead circuit, but has only one secondary choke. The design of this circuit is made in such a manner that when the switch is closed and power made available to the lamps, starting voltage is applied to one lamp with the current being limited by an impedance in parallel with the second lamp. This impedance provides current for the second lamp. As the impedance in the two lamps decreases, the lamps run in series with increasingly higher current until stabilized at the proper operating current.

In the Lag-Lead circuit two separate chokes operate two separate lamps individually, each with its own starting and operating voltage and currents. Each lamp is independent of the other. In the Sequence-Start Series type ballast there is one choke with each lamp dependent on it for starting and each lamp depending on the other and the choke for operation. In the Lag-Lead circuit both lamps start simultaneously and are approximately 120 electrical degrees out of phase. In the Series ballast one lamp starts before the other and they are in almost perfect phase.

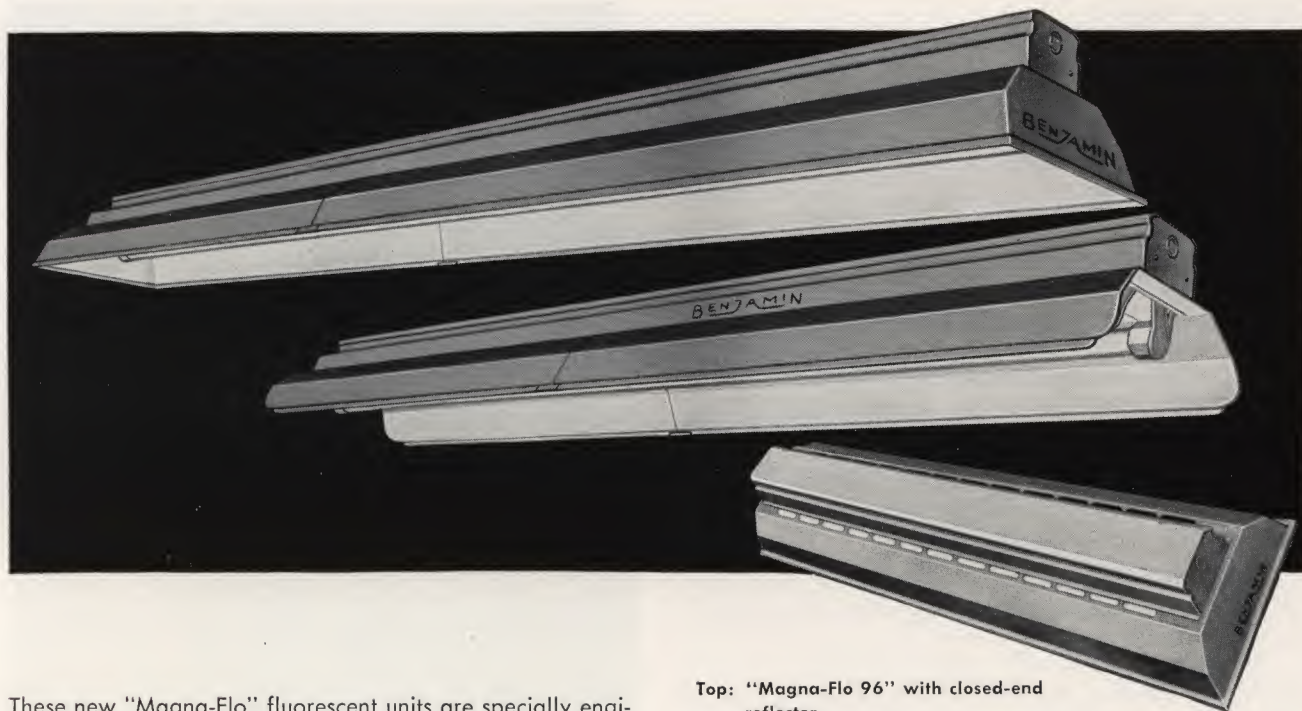
(Issued May 29, 1952)

File in Section 13-a
Benjamin General Catalog

Benjamin "Magna-Flo" Individual Units*

for 96, 72 and 48-inch T12 Slimline Lamps

Approved by Underwriters' Laboratories, Inc.



These new "Magna-Flo" fluorescent units are specially engineered to take the modern, new slimline lamps. As a result, they assure the utmost in high efficiency, long lamp life and low upkeep offered by these instant start lamps.

And of course, "Magna-Flo" units are built to "take it" in the traditional Benjamin manner—heavy gauge materials combined with engineered ruggedness. Porcelain enameled reflectors give high lighting efficiency for the life of the unit; and the best in control equipment plus the new "Springlox" lamp holder assure a long life of trouble-free operation.

FEATURES

Exclusive "Springlox" Lamp Holder Assembly—This sturdy lamp holder assembly for slimline lamp cuts maintenance time and costs to a minimum and provides a high degree of safety.

Lamp holder assemblies consist of two metal-clad ends designated as a push-end and a switch-end. These ends are positioned in the housings by a unique slotted arrangement that permits precise, rigid mounting. Lamps are quickly inserted by pushing one lamp pin into the push-end of the lamp holder which retracts to allow enough clearance for the other end of the lamp to slip into the switch-end.

"Springlox" lamp holders are designed for safety, too. Lamps of even minimum and maximum tolerance are locked into place and cannot vibrate loose. This locking results from the compression coil springs in each end of the lamp holder and from the precise and rigid mounting of the lamp holders themselves.

Top: "Magna-Flo 96" with closed-end reflector.

Middle: "Magna-Flo 72" with open-end reflector.

Bottom: "Magna-Flo 48" with closed-end reflector with apertures.

The switch-end of "Springlox" has a fast-acting, cutout switch for the primary circuit that protects against shock when inserting or removing lamps.

Four Reflector Styles—Porcelain enameled steel reflectors are available in both closed and open-end styles. These two styles are available with or without apertures. Apertures direct approximately 5% of the light upward to reduce excessive brightness contrasts.

Hand-operated "Lok-Latch" fasteners permit reflectors to be rapidly attached or detached from the housing without disturbing the wiring or position of the unit.

Reflector Construction—Reflectors for 96-inch and 72-inch lamp units are made in two sections for easier handling. The two sections overlap and are rigidly connected by a positive aligning clip that slides quickly into place over the reflector beads.

*All "Magna-Flo" units having open-end reflectors (without apertures) plus "Magna-Flo 48" units having closed-end reflectors (without apertures) are RLM Standard. At this time there are no RLM Specifications covering other "Magna-Flo" units.

Lighting Data & Specifications

for Benjamin "Magna-Flo" Individual Units

LIGHTING DATA

On two-lamp units, when a line is drawn perpendicular to the reflector bead and tangent to the lower edge of the opposite lamp, this line forms a shielding angle of 13°. Three-lamp units also have a shielding angle of 13°. All reflectors have a minimum reflection factor of 82%.

Coefficients of Utilization for "Magna-Flo" units are listed in Section I of the Benjamin General Catalog.

SPECIFICATIONS

Housings—Fabricated of 20 gauge steel, finished inside and out with durable, baked gray enamel over a phosphorizing treatment that gives excellent corrosion protection. Housings contain control equipment for operating either two or three fluorescent lamps per reflector plus a facing pair of Benjamin, Metal-clad "Springlox" lamp holder assemblies for single-pin, slimline lamps. All housings are supplied wired with 6-inch leads. Housings are also available wired with 6-foot, 2 or 3 wire cord and plug sets.

Chain hanger brackets and a variety of knockouts are provided in each housing. See Table below for diameters and centers.

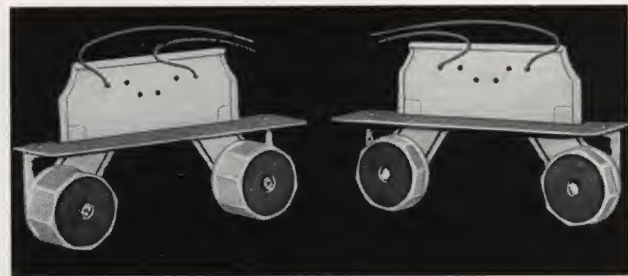
Knockout Data for "Magna-Flo" Housings

Housing Description	Chain Bracket Centers	1/2-inch I.P.K.O. Centers	3/8-inch Dia. K.O. Centers	1/2-inch I.P.K.O. Centers	3/4-inch I.P.K.O. Centers
For two lamps:					
"Magna-Flo 48"	39 3/4"	39 3/4"	37 3/4"	35"	32"
"Magna-Flo 72"	63 3/4"	63 3/4"	61 3/4"	59"	56"
"Magna-Flo 96"	87 3/4"	87 3/4"	85 3/4"	83"	80"
For three lamps:					
"Magna-Flo 48"	39 3/4"	39 3/4"	37 3/4"	35"	32"
"Magna-Flo 72"	63 3/4"	63 3/4"	61 3/4"	...	...
"Magna-Flo 96"	87 3/4"	87 3/4"	85 3/4"	...	...

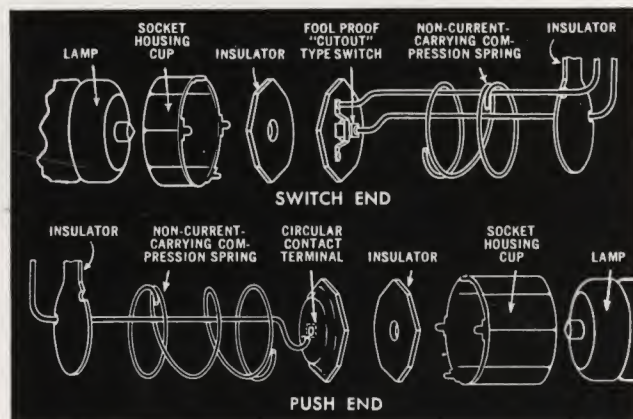
Reflectors—Formed of 20 gauge steel completely covered with Benjamin lifetime porcelain enamel—outer surfaces are finished gray; reflecting surfaces are finished white. All reflector styles can be detached from housings by a quarter turn of several hand-operated "Lok-Latch" fasteners.

Reflectors for 48-inch lamps are one-piece. Reflectors for 72-inch and 96-inch lamps are made in two sections for easy handling. The two sections overlap 3/4-inch and are rigidly connected by a positive aligning clip that slides quickly into place over the reflector beads.

Lamp Holders—Lamp holder bodies for slimline fluorescent lamps are constructed of metal. Twin lamp holders give 5-inch lamp spacing and triple lamp holders, 2 1/2-inch spacing. All non-current carrying metal parts are electroplated and when exposed are iridited so that the finish coat of white baked paint enamel will adhere firmly and under-surface will not bleed.



Patented Benjamin "Springlox" twin lamp holder assembly for single pin, slimline lamps. Left: Push-End. Right: Switch-End.



Internal construction of the "Springlox" lamp holder assembly that helps make it so long-lived and trouble-free in operation.



"Springlox" lamp holders permit quick, easy replacement of lamps.

This lamp holder bears Underwriters' Laboratories approval. Slimline lamp holders incorporate a cutout type terminal switch, so designed as to open the primary circuit when only one end of any slimline lamp is removed from the lighting unit.

The design of this cutout type terminal switch and other lamp contacts is such as to make positive contact with lamp pins at all times. Contacts can in no way become separated, bent, twisted or distorted causing faulty lamp pin contact as a result of lamp insertion and removal.

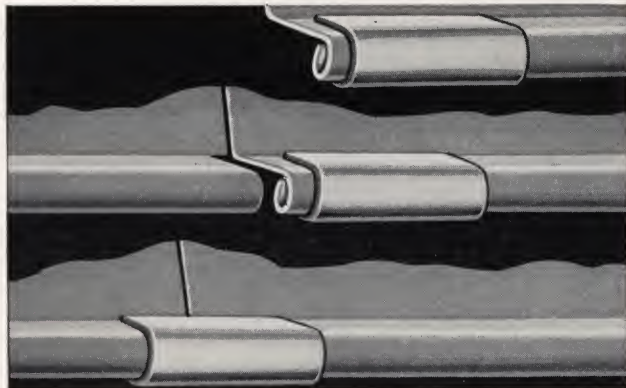
Specifications & Mounting Data

for Benjamin "Magna-Flo" Individual Units

Ballasts—All two-lamp housings are provided with a high power factor, twin-lamp, instant start slimline ballast. Three-lamp housings are provided with one twin-lamp and one single-lamp high power factor, instant start slimline ballast. Ballasts regularly supplied are for 110-125V. or 220-250V. 60 cycle operation at 430 MA. and operate lamps out of phase to minimize cyclic light flicker.



Left—Conduit-Mounted "Magna-Flo" units. Units may also be mounted with rods. Right—Chain-mounted "Magna-Flo" units. Chain brackets are supplied with each unit.



(Top) One half of two-piece reflector in position with aligning clip on bead. See picture below right. (Middle) Both halves of reflector in place. (Bottom) Aligning Clip in position over junction of reflector beads.

Attaching two-section reflector to a 96-inch or 72-inch lamp unit. Inset shows Benjamin hand-operated "Lok-Latch" reflector fasteners that permit quick assembly and removal of reflectors.



Power Consumption—The table below lists the approximate total watts consumed by each size of "Magna-Flo" Unit.

Unit Description	No. of Lamps	Approx. Watts per Lamp	Approx. Total Watts
"Magna-Flo 48"	2	40	108
"Magna-Flo 72"	2	56	145
"Magna-Flo 96"	2	75	190
"Magna-Flo 48"	3	40	163
"Magna-Flo 72"	3	56	223
"Magna-Flo 96"	3	75	290

Provisions for Grounding—Metal to metal bond is provided between reflectors and housings for grounding.

MOUNTING DATA

Two Lamp Units—Convenient knockouts for stationary conduit and rod suspension are located in the tops of all housings. Chain hanger brackets are also supplied at both ends of all housings for use with chain hanger suspensions. See table in specifications paragraph on Housings for location and size of knockouts and chain hanger brackets.

Sliding hanger suspension fittings that attach at any point along the continuous groove in housings are ideal for mounting units on ceilings with obstructions. See page 374C-8.

Three Lamp Units—See table in specifications paragraph on Housings for location and size of available knockouts and chain hanger brackets.

Sliding hanger suspension fittings that attach at any point along the continuous groove in housings are ideal for mounting units on ceilings with obstructions. See page 374C-8.

ASSURED PERFORMANCE

Auxiliary control equipment is certified by Electrical Testing Laboratories and by the manufacturer. Ballasts and lamp holders are listed separately by Underwriters' Laboratories and complete units carry Underwriters' Laboratories Inspection Label.

"Magna-Flo 96" with Closed-End Reflectors

Individual Units for 96-inch, T12 Slimline Lamps

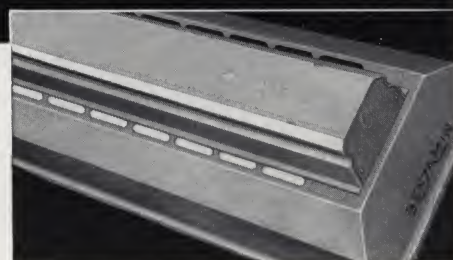
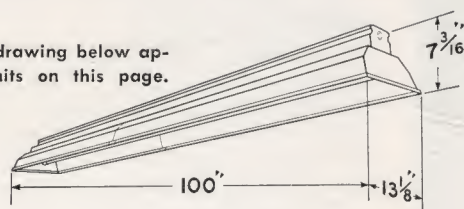
Approved by Underwriters' Laboratories, Inc.

(Specifications on pages 374B-2 & 374B-3)



Cat. No. 96202 (Without Apertures)

Dimensions shown on drawing below apply to all lighting units on this page.



Cat. No. 96222 (With Apertures)

TWO-LAMP INDIVIDUAL UNITS—COMPLETE WITH END CAPS & WIRED WITH 6-INCH LEADS

With Porcelain Enameled, Closed-End Reflectors (without Apertures) and Chain Support Brackets

Voltage (60 Cycles)	Lamp Data		Ballast (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
	Approx. Current	Approx. Watts					Ref. Only	Housing Assemb.
110-125V.	430 MA.	2-75	One twin-lamp	53	96202	\$68.00	M9620	M6102
220-250V.	430 MA.	2-75	One twin-lamp	53	96212	78.70	M9620	M6112

With Porcelain Enameled, Closed-End Reflectors (with Apertures) and Chain Support Brackets

110-125V.	430 MA.	2-75	One twin-lamp	51½	96222	\$69.60	M9622	M6102
220-250V.	430 MA.	2-75	One twin-lamp	51½	96232	80.30	M9622	M6112

THREE-LAMP INDIVIDUAL UNITS—COMPLETE WITH END CAPS & WIRED WITH 6-INCH LEADS

With Porcelain Enameled, Closed-End Reflectors (without Apertures) and Chain Support Brackets

Voltage (60 Cycles)	Lamp Data		Ballast (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
	Approx. Current	Approx. Watts					Ref. Only	Housing Assemb.
110-125V.	430 MA.	3-75	One twin plus one single-lamp	66	96203	\$ 92.00	M9620	M6103
220-250V.	430 MA.	3-75	One twin plus one single-lamp	66	96213	110.70	M9620	M6113

With Porcelain Enameled, Closed-End Reflectors (with Apertures) and Chain Support Brackets

110-125V.	430 MA.	3-75	One twin plus one single-lamp	64½	96223	\$ 93.60	M9622	M6103
220-250V.	430 MA.	3-75	One twin plus one single-lamp	64½	96233	112.30	M9622	M6113

Units with 6-foot Cord and Plug—To order, suffix unit Cat. Nos. with "C" for 2-wire cord (for 110-125V. units only) and plug and add \$1.20

to unit list price; for 3-wire cord and plug, suffix unit Cat. Nos. with "P" and add \$2.00. Lamps are not supplied.

RLM "Magna-Flo 96" with Open-End Reflectors

Individual Units for 96-inch, T12 Slimline Lamps

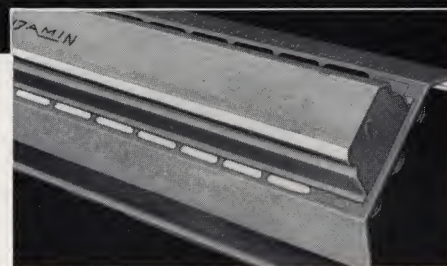
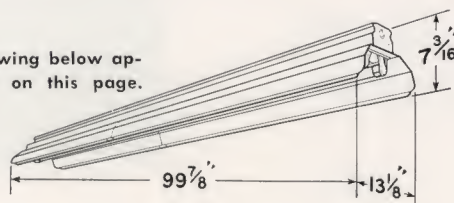
Approved by Underwriters' Laboratories, Inc.

(Specifications on pages 374B-2 & 374B-3)



Cat. No. 96102 (Without Apertures)

Dimensions shown on drawing below apply to all lighting units on this page.



Cat. No. 96123 (With Apertures)

TWO-LAMP INDIVIDUAL UNITS—COMPLETE WITH END CAPS & WIRED WITH 6-INCH LEADS

With Porcelain Enameled, Open-End Reflectors (without Apertures) and Chain Support Brackets

Voltage (60 Cycles)	Lamp Data		Ballast (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
	Approx. Current	Approx. Watts					Refl. Only	Housing Assemb.
110-125V.	430 MA.	2-75	One twin-lamp	51½	96102	\$64.00	M9610	M6102
220-250V.	430 MA.	2-75	One twin-lamp	51½	96112	74.70	M9610	M6112

With Porcelain Enameled, Open-End Reflectors (with Apertures) and Chain Support Brackets*

110-125V.	430 MA.	2-75	One twin-lamp	50	96122	\$65.60	M9612	M6102
220-250V.	430 MA.	2-75	One twin-lamp	50	96132	76.30	M9612	M6112

THREE-LAMP INDIVIDUAL UNITS—COMPLETE WITH END CAPS & WIRED WITH 6-INCH LEADS

With Porcelain Enameled, Open-End Reflectors (without Apertures) and Chain Support Brackets

Voltage (60 Cycles)	Lamp Data		Ballast (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
	Approx. Current	Approx. Watts					Refl. Only	Housing Assemb.
110-125V.	430 MA.	3-75	One twin plus one single-lamp	64½	96103	\$ 88.00	M9610	M6103
220-250V.	430 MA.	3-75	One twin plus one single-lamp	64½	96113	106.70	M9610	M6113

With Porcelain Enameled, Open-End Reflectors (with Apertures) and Chain Support Brackets*

110-125V.	430 MA.	3-75	One twin plus one single-lamp	63	96123	\$ 89.60	M9612	M6103
220-250V.	430 MA.	3-75	One twin plus one single-lamp	63	96133	108.30	M9612	M6113

*Not RLM Standard.

Units with 6-foot Cord and Plug—To order, suffix unit Cat. Nos. with "C" for 2-wire cord (for 110-125V. units only) and plug and add \$1.20

to unit list price; for 3-wire cord and plug, suffix unit Cat. Nos. with "P" and add \$2.00.

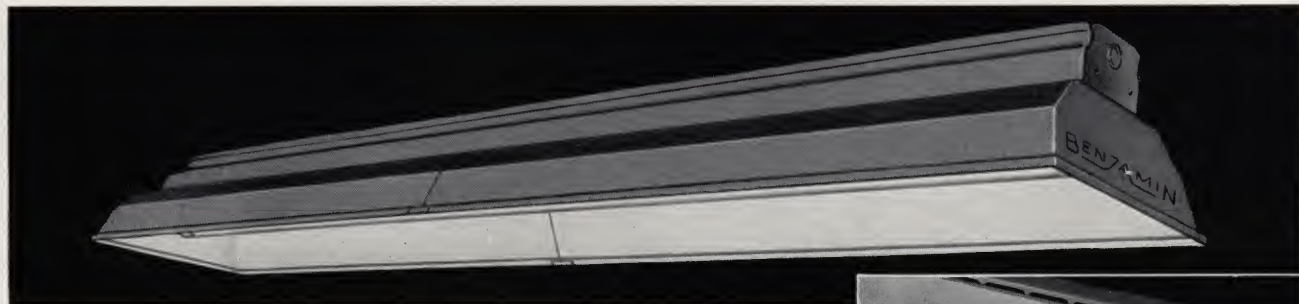
Lamps are not supplied.

"Magna-Flo 72" with Closed-End Reflectors

Individual Units for 72-inch, T12 Slimline Lamps

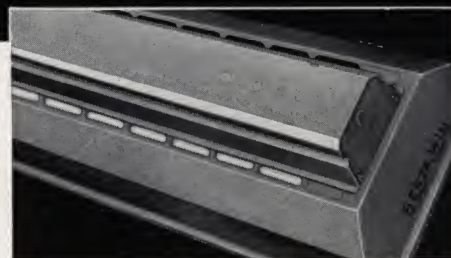
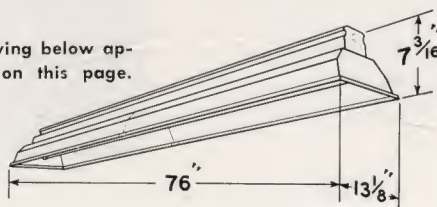
Approved by Underwriters' Laboratories, Inc.

(Specifications on pages 374B-2 & 374B-3)



Cat. No. 72202 (Without Apertures)

Dimensions shown on drawing below apply to all lighting units on this page.



Cat. No. 72222 (With Apertures)

TWO-LAMP INDIVIDUAL UNITS—COMPLETE WITH END CAPS & WIRED WITH 6-INCH LEADS

With Porcelain Enameled, Closed-End Reflectors (without Apertures) and Chain Support Brackets

Voltage (60 Cycles)	Lamp Data		Ballast (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
	Approx. Current	Approx. Watts					Refl. Only	Housing Assemb.
110-125V.	430 MA.	2-56	One twin-lamp	42	72202	\$60.00	M7220	M2102
220-250V.	430 MA.	2-56	One twin-lamp	42	72212	69.40	M7220	M2112

With Porcelain Enameled, Closed-End Reflectors (with Apertures) and Chain Support Brackets

110-125V.	430 MA.	2-56	One twin-lamp	40 3/4	72222	\$61.20	M7222	M2102
220-250V.	430 MA.	2-56	One twin-lamp	40 3/4	72232	70.60	M7222	M2112

THREE-LAMP INDIVIDUAL UNITS—COMPLETE WITH END CAPS & WIRED WITH 6-INCH LEADS

With Porcelain Enameled, Closed-End Reflectors (without Apertures) and Chain Support Brackets

Voltage (60 Cycles)	Lamp Data		Ballast (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
	Approx. Current	Approx. Watts					Refl. Only	Housing Assemb.
110-125V.	430 MA.	3-56	One twin plus one single-lamp	52	72203	\$84.00	M7220	M2103
220-250V.	430 MA.	3-56	One twin plus one single-lamp	52	72213	101.40	M7220	M2113

With Porcelain Enameled, Closed-End Reflectors (with Apertures) and Chain Support Brackets

110-125V.	430 MA.	3-56	One twin plus one single-lamp	50 3/4	72223	\$85.20	M7222	M2103
220-250V.	430 MA.	3-56	One twin plus one single-lamp	50 3/4	72233	102.60	M7222	M2113

Units with 6-foot Cord and Plug—To order, suffix unit Cat. Nos. with "C" for 2-wire cord (for 110-125V. units only) and plug and add \$1.20

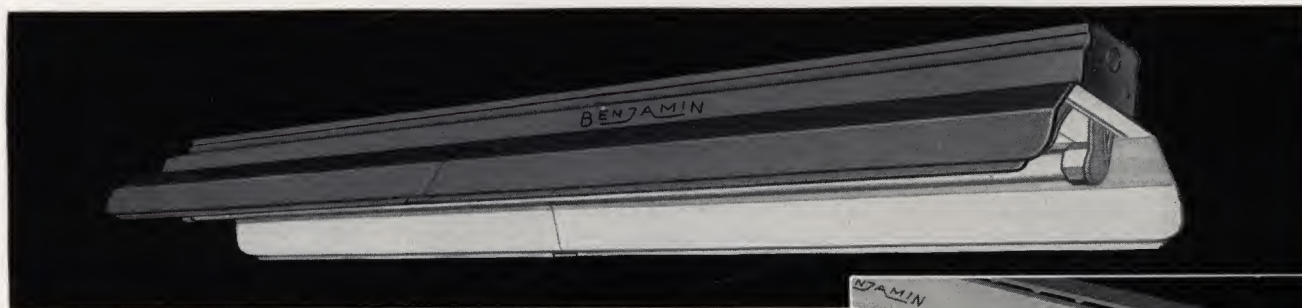
to unit list price; for 3-wire cord and plug, suffix unit Cat. Nos. with "P" and add \$2.00. Lamps are not supplied.

RLM "Magna-Flo 72" with Open-End Reflectors

Individual Units for 72-inch, T12 Slimline Lamps

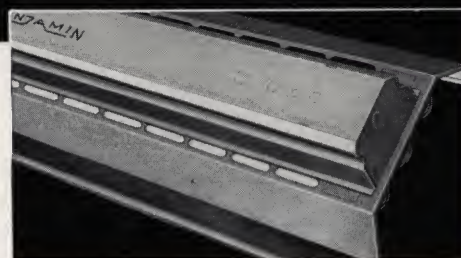
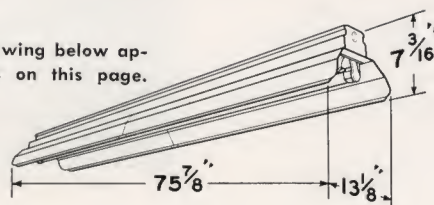
Approved by Underwriters' Laboratories, Inc.

(Specifications on pages 374B-2 & 374B-3)



Cat. No. 72102 (Without Apertures)

Dimensions shown on drawing below apply to all lighting units on this page.



Cat. No. 72123 (With Apertures)

TWO-LAMP INDIVIDUAL UNITS—COMPLETE WITH END CAPS & WIRED WITH 6-INCH LEADS

With Porcelain Enameled, Open-End Reflectors (without Apertures) and Chain Support Brackets

Voltage (60 Cycles)	Lamp Data		Ballast (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
	Approx. Current	Approx. Watts					Refl. Only	Housing Assemb.
110-125V.	430 MA.	2-56	One twin-lamp	40½	72102	\$56.00	M7210	M2102
220-250V.	430 MA.	2-56	One twin-lamp	40½	72112	65.40	M7210	M2112

With Porcelain Enameled, Open-End Reflectors (with Apertures) and Chain Support Brackets*

110-125V.	430 MA.	2-56	One twin-lamp	39¼	72122	\$57.20	M7212	M2102
220-250V.	430 MA.	2-56	One twin-lamp	39¼	72132	66.60	M7212	M2112

THREE-LAMP INDIVIDUAL UNITS—COMPLETE WITH END CAPS & WIRED WITH 6-INCH LEADS

With Porcelain Enameled, Open-End Reflectors (without Apertures) and Chain Support Brackets

Voltage (60 Cycles)	Lamp Data		Ballast (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
	Approx. Current	Approx. Watts					Refl. Only	Housing Assemb.
110-125V.	430 MA.	3-56	One twin plus one single-lamp	50½	72103	\$80.00	M7210	M2103
220-250V.	430 MA.	3-56	One twin plus one single-lamp	50½	72113	97.40	M7210	M2113

With Porcelain Enameled, Open-End Reflectors (with Apertures) and Chain Support Brackets*

110-125V.	430 MA.	3-56	One twin plus one single-lamp	49¼	72123	\$81.20	M7212	M2103
220-250V.	430 MA.	3-56	One twin plus one single-lamp	49¼	72133	98.60	M7212	M2113

*Not RLM Standard.

Units with 6-foot Cord and Plug—To order, suffix unit Cat. Nos. with "C" for 2-wire cord (for 110-125V. units only) and plug and add \$1.20

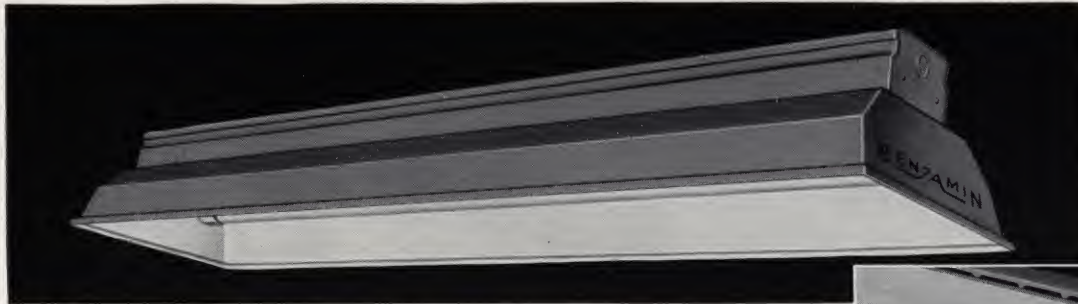
to unit list price; for 3-wire cord and plug, suffix unit Cat. Nos. with "P" and add \$2.00.
Lamps are not supplied.

RLM "Magna-Flo 48" with Closed-End Reflectors

Individual Units for 48-inch, T12 Slimline Lamps

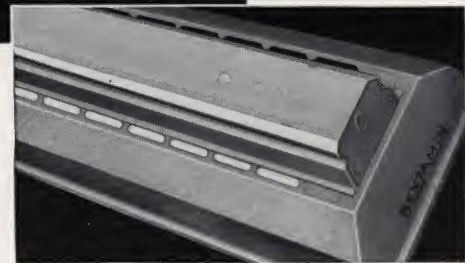
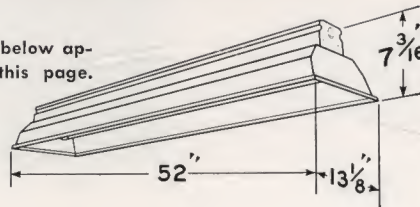
Approved by Underwriters' Laboratories, Inc.

(Specifications on pages 374B-2 & 374B-3)



Cat. No. 48202 (Without Apertures)

Dimensions shown on drawing below apply to all lighting units on this page.



Cat. No. 48222 (With Apertures)

TWO-LAMP INDIVIDUAL UNITS—COMPLETE WITH END CAPS & WIRED WITH 6-INCH LEADS

With Porcelain Enameled, Closed-End Reflectors (without Apertures) and Chain Support Brackets

Voltage (60 Cycles)	Lamp Data		Ballast (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
	Approx. Current	Approx. Watts					Refl. Only	Housing Assemb.
110-125V.	430 MA.	2-40	One twin-lamp	31	48202	\$39.20	M4820	M8102
220-250V.	430 MA.	2-40	One twin-lamp	31	48212	45.90	M4820	M8112

With Porcelain Enameled, Closed-End Reflectors (with Apertures) and Chain Support Brackets*

110-125V.	430 MA.	2-40	One twin-lamp	30 1/4	48222	\$40.00	M4822	M8102
220-250V.	430 MA.	2-40	One twin-lamp	30 1/4	48232	46.70	M4822	M8112

THREE-LAMP INDIVIDUAL UNITS—COMPLETE WITH END CAPS & WIRED WITH 6-INCH LEADS

With Porcelain Enameled, Closed-End Reflectors (without Apertures) and Chain Support Brackets

Voltage (60 Cycles)	Lamp Data		Ballast (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
	Approx. Current	Approx. Watts					Refl. Only	Housing Assemb.
110-125V.	430 MA.	3-40	One twin plus one single-lamp	42	48203	\$59.20	M4820	M8103
220-250V.	430 MA.	3-40	One twin plus one single-lamp	42	48213	72.30	M4820	M8113

With Porcelain Enameled, Closed-End Reflectors (with Apertures) and Chain Support Brackets*

110-125V.	430 MA.	3-40	One twin plus one single-lamp	41 1/4	48223	\$60.00	M4822	M8103
220-250V.	430 MA.	3-40	One twin plus one single-lamp	41 1/4	48233	73.10	M4822	M8113

*Not RLM Standard.

Units with 6-foot Cord and Plug—To order, suffix unit Cat. Nos. with "C" for 2-wire cord (for 110-125V. units only) and plug and add \$1.20

to unit list price; for 3-wire cord and plug, suffix unit Cat. Nos. with "P" and add \$2.00.

Lamps are not supplied.

RLM "Magna-Flo 48" with Open-End Reflectors

Individual Units for 48-inch, T12 Slimline Lamps

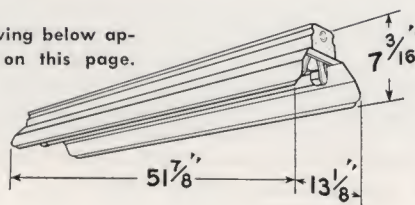
Approved by Underwriters' Laboratories, Inc.

(Specifications on pages 374B-2 & 374B-3)



Cat. No. 48102 (Without Apertures)

Dimensions shown on drawing below apply to all lighting units on this page.



Cat. No. 48123 (With Apertures)

TWO-LAMP INDIVIDUAL UNITS—COMPLETE WITH END CAPS & WIRED WITH 6-INCH LEADS

With Porcelain Enameled, Open-End Reflectors (without Apertures) and Chain Support Brackets

Voltage (60 Cycles)	Lamp Data		Ballast (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
	Approx. Current	Approx. Watts					Refl. Only	Housing Assemb.
110-125V.	430 MA.	2-40	One twin-lamp	29½	48102	\$36.00	M4810	M8102
220-250V.	430 MA.	2-40	One twin-lamp	29½	M-48112	42.70	M4810	M8112

With Porcelain Enameled, Open-End Reflectors (with Apertures) and Chain Support Brackets*

110-125V.	430 MA.	2-40	One twin-lamp	28¾	48122	\$36.80	M4812	M8102
220-250V.	430 MA.	2-40	One twin-lamp	28¾	M-48132	43.50	M4812	M8112

THREE-LAMP INDIVIDUAL UNITS—COMPLETE WITH END CAPS & WIRED WITH 6-INCH LEADS

With Porcelain Enameled, Open-End Reflectors (without Apertures) and Chain Support Brackets

Voltage (60 Cycles)	Lamp Data		Ballast (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts	
	Approx. Current	Approx. Watts					Refl. Only	Housing Assemb.
110-125V.	430 MA.	3-40	One twin plus one single-lamp	40½	48103	\$56.00	M4810	M8103
220-250V.	430 MA.	3-40	One twin plus one single-lamp	40½	M-48113	69.10	M4810	M8113

With Porcelain Enameled, Open-End Reflectors (with Apertures) and Chain Support Brackets*

110-125V.	430 MA.	3-40	One twin plus one single-lamp	39¾	48123	\$56.80	M4812	M8103
220-250V.	430 MA.	3-40	One twin plus one single-lamp	39¾	M-48133	69.90	M4812	M8113

*Not RLM Standard.

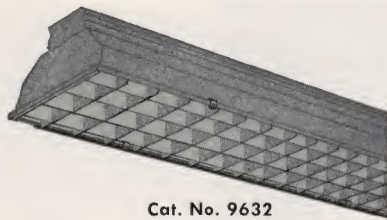
Units with 6-foot Cord and Plug—To order, suffix unit Cat. Nos. with "C" for 2-wire cord (for 110-125V. units only) and plug and add \$1.20

to unit list price; for 3-wire cord and plug, suffix unit Cat. Nos. with "P" and add \$2.00.

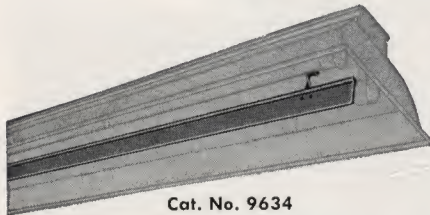
Lamps are not supplied.

Accessories for "Magna-Flo" Systems

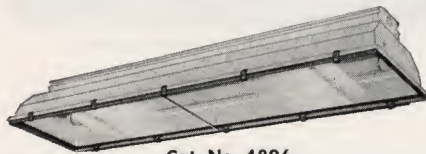
For Individual Lighting Units listed on pages 374B-4 to 374B-9 and
Continuous Line Lighting Systems listed on pages 374C-6 and 374C-7



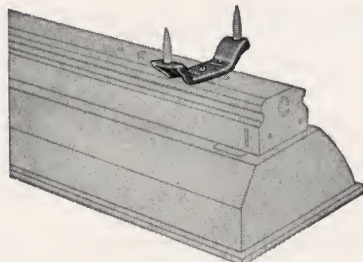
Cat. No. 9632
(Louver only)



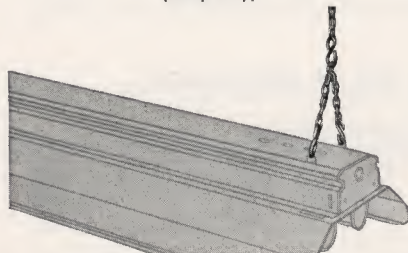
Cat. No. 9634
(Shield only)



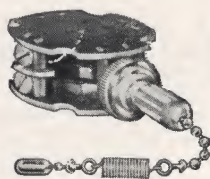
Cat. No. 4896
(Cover only)



Cat. No. 18431
(Strap only)



Cat. No. 5243
(Chain only)



Cat. No. 5261



Cat. No. 5262

HINGED LOUVERS FOR TWO OR THREE-LAMP SYSTEMS

Made of steel finished in baked white enamel (reflection factor is 80%)

Description	Shielding Angle		Cat. No.	List Price
	Cross-wise	Length-wise		
For "Magna-Flo 96" Systems (Two-Piece)	30°	25°	9632	\$18.00
For "Magna-Flo 72" Systems	30°	25°	M-7232	18.00
For "Magna-Flo 48" Systems	30°	25°	4832	9.00

LONGITUDINAL SHIELDS FOR TWO-LAMP SYSTEMS ONLY

Made of steel finished in white porcelain enamel

Description	Shielding Angle	Cat. No.	List Price
For "Magna-Flo 96" Systems (Two-Piece)	27°	9634	\$6.00
For "Magna-Flo 72" Systems (Two-Piece)	27°	7234	4.50
For "Magna-Flo 48" Systems	27°	4834	3.00

HINGED COVERS FOR TWO OR THREE-LAMP "MAGNA-FLO 48" SYSTEMS ONLY WITH CLOSED-END REFLECTORS—with extruded rubber gasket

Description	Cat. No.	List Price
Complete Cover with Plain, Clear Glass	4896	\$19.20
Complete Cover with Clear Plastic*	4892	37.20
Complete Cover with Opal Glass	4897	24.90
Clear Glass with Gasket only—for replacement	4898	\$ 8.90
Clear Plastic* with Gasket only—for replacement	4894	26.90
Opal Glass with Gasket only—for replacement	4899	14.60

* Methyl Methacrylate—Lucite or Plexiglass.

CEILING STRAPS FOR STATIONARY SUSPENSION

Made of steel finished in baked gray enamel

Description	Cat. No.	List Price
Offset Strap with center hole for 1/2" Conduit†	18441	\$0.50
Offset Strap with center hole for 3/8" Rod or 5/16" Bolt‡	18431†	.50
Flat Strap with center hole for 3/8" Rod or 5/16" Bolt‡	18432†	.50

† 5/16" nut and bolt supplied.

‡ Two additional pairs of 25/64" holes are spaced on 3 3/8" and 7 1/2" centers.

CHAIN SUSPENSION

Description	Cat. No.	List Price
1 pr. 5 ft. Heavy Duty Chain Assemblies, Complete with Hooks	5243	\$1.80

LEVOLIER SWITCHES WITH 7 FT. CORD

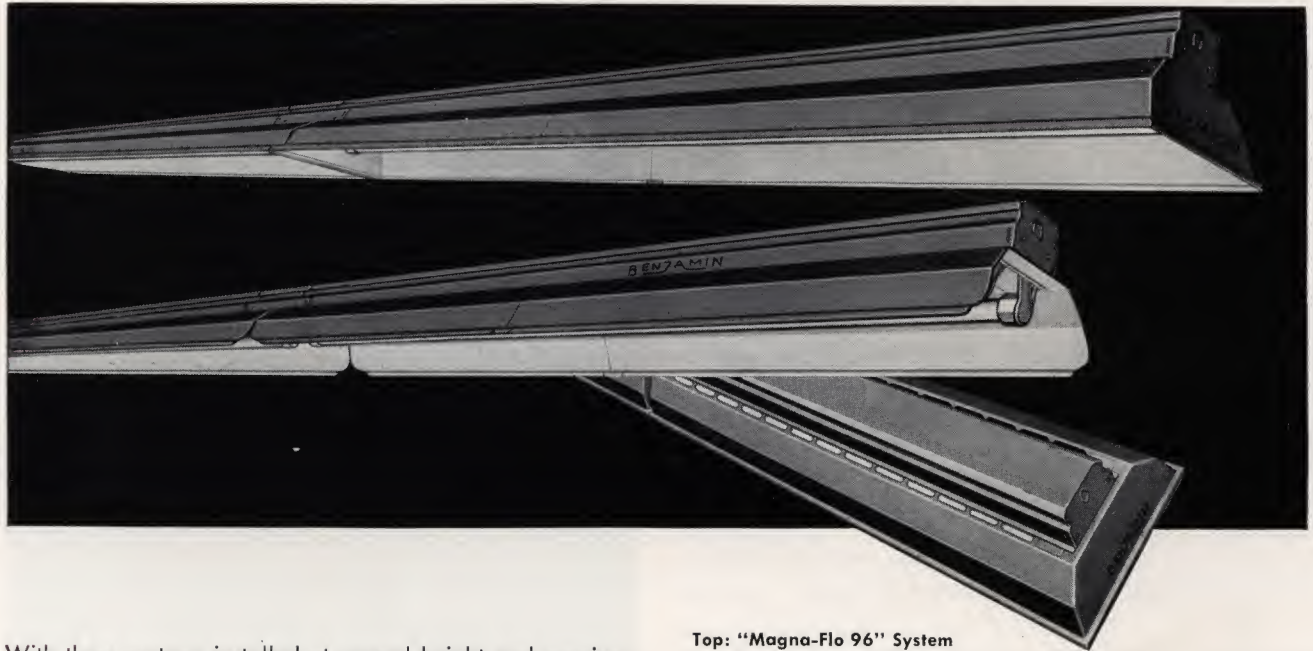
Not sold separately except for replacement

Description	Suffix used to Specify Switches on Complete Unit	Cat. No.	List Price
No. 41, Single Pole 6 amp., 125V., 3 amp., 250V.	LA	5261	\$1.60
No. 276, Double Pole 6 amp., 125V., 3 amp., 250V.	LB	5262	2.00

"Magna-Flo" Continuous Line Systems*

for 96-inch, 72-inch, 48-inch T12 Slimline Lamps

Approved by Underwriters' Laboratories, Inc.



With these systems installed at normal height and spacing, it is possible to utilize the maximum amount of available floor space and to obtain high levels of illumination on the working plane. Moreover, these systems provide adequate levels of illumination where ceiling conditions require fairly high mounting and wide spacing.

FEATURES

The basis of these continuous line, fluorescent systems is a two or three lamp, steel channel section together with one of four different styles of porcelain enameled reflectors.

The channel sections form a continuous wireway enclosure when joined end to end by means of rigid, channel couplings. Exposed ends of channel sections at each end of the line are closed by easily attached end caps. As a greater part of the branch circuit wiring is carried within the channel, much of the usual expenditure for conduit, outlet boxes and fittings is eliminated.

Exclusive "Springlox" Lamp Holder Assembly—This sturdy lamp holder assembly for slimline lamp cuts maintenance time and costs to a minimum and provides a high degree of safety.

Lamp holder assemblies consist of two metal-clad ends designated as a push-end and a switch-end. These ends are positioned in the housings by a unique slotted arrangement that permits precise, rigid mounting. Lamps are quickly inserted by pushing one lamp pin into the push-end of the lamp holder which retracts to allow enough clearance for the other end of the lamp to slip into the switch-end.

Top: "Magna-Flo 96" System with Closed-End Reflectors.

Middle: "Magna-Flo 72" System with Open-End Reflectors.

Bottom: "Magna-Flo 48" System with Closed-End Reflectors with Apertures.

"Springlox" lamp holders are designed for safety, too. Lamps of even minimum and maximum tolerance are locked into place and cannot vibrate loose. This locking results from the compression coil springs in each end of the lamp holder and from the precise and rigid mounting of the lamp holders themselves.

Four Reflector Styles—Porcelain enameled steel reflectors are available in both closed and open-end styles. These two styles are available with or without apertures. Apertures direct approximately 5% of the light upward to reduce excessive brightness contrasts.

Hand-operated "Lok-Latch" fasteners permit reflectors to be rapidly attached or detached from the housing without disturbing the wiring or position of the unit.

Reflector Construction—Reflectors for 96-inch and 72-inch lamp units are made in two sections for easier handling. The two sections overlap and are rigidly connected by a positive aligning clip that slides quickly into place over the reflector beads.

*All "Magna-Flo" systems having open-end reflectors (without apertures) plus "Magna-Flo 48" systems having closed-end reflectors (without apertures) are RLM Standard. At this time there are no RLM Specifications covering other "Magna-Flo" units.

Lighting Data & Specifications

for Benjamin "Magna-Flo" Continuous Line Lighting Systems

LIGHTING DATA

On two-lamp systems, when a line is drawn perpendicular to the reflector bead and tangent to the lower edge of the opposite lamp, this line forms a shielding angle of 13°. Three-lamp systems also have a shielding angle of 13°. All reflectors have a minimum reflection factor of 82%.

Coefficients of Utilization for "Magna-Flo" systems are listed in Section I of the Benjamin General Catalog.

SPECIFICATIONS

Channels—Fabricated of 20 gauge steel, finished inside and out with durable, baked gray enamel over a phosphorizing treatment that gives excellent corrosion protection. Channels contain control equipment for operating either two or three fluorescent lamps per reflector plus a facing pair of Benjamin, Metal-clad "Springlox" lamp holder assemblies for single-pin, slimline lamps. All channels are supplied wired with 6-inch leads. Channels are also available wired with 6-foot, 2 or 3 wire cord and plug sets.

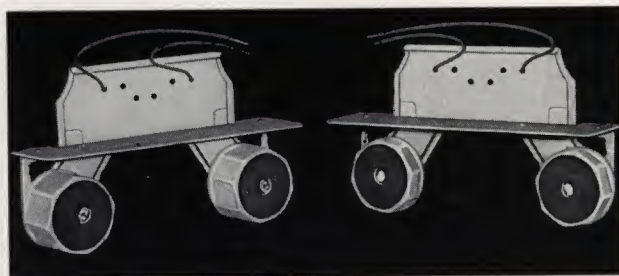
Knockout Data for "Magna-Flo" Channels

Channel Description	1/2-inch I.P.K.O. Centers	3/8-inch Dia. K.O. Centers	1/2-inch I.P.K.O. Centers	3/4-inch I.P.K.O. Centers
For two lamps:				
"Magna-Flo 48"	39 3/4"	37 3/4"	35"	32"
"Magna-Flo 72"	63 3/4"	61 3/4"	59"	56"
"Magna-Flo 96"	87 3/4"	85 3/4"	83"	80"
For three lamps:				
"Magna-Flo 48"	39 3/4"	37 3/4"	35"	32"
"Magna-Flo 72"	63 3/4"	61 3/4"	....	....
"Magna-Flo 96"	87 3/4"	85 3/4"	....	....

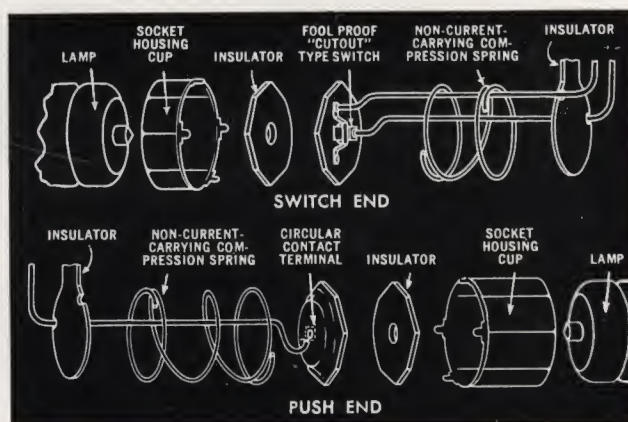
Reflectors—Formed of 20 gauge steel completely covered with Benjamin lifetime porcelain enamel—outer surfaces are finished gray; reflecting surfaces are finished white. All reflector styles can be detached from channels by a quarter turn of several hand-operated "Lok-Latch" fasteners.

Reflectors for 48-inch lamps are one-piece. Reflectors for 72-inch and 96-inch lamps are made in two sections for easy handling. The two sections overlap 3/4-inch and are rigidly connected by a positive aligning clip that slides quickly into place over the reflector beads.

Lamp Holders—Lamp holder bodies for slimline fluorescent lamps are constructed of metal. Twin lamp holders give 5 1/2-inch lamp spacing and triple lamp holders, 2 1/2-inch spacing. All non-current carrying metal parts are electroplated and when exposed are iridited so that the finish coat of white baked paint enamel will adhere firmly and under-surface will not bleed.



Patented Benjamin "Springlox" metal-clad lamp holder assembly for single pin, slimline lamps. Left: Push-End. Right: Switch-End.



Internal construction of the "Springlox" lamp holder assembly that helps make it so long-lived and trouble-free in operation.



"Springlox" lamp holders permit quick, easy replacement of lamps.

This lamp holder bears Underwriters' Laboratories approval. Slimline lamp holders incorporate a cutout type terminal switch, so designed as to open the primary circuit when only one end of any slimline lamp is removed from the lighting unit.

The design of this cutout type terminal switch and other lamp contacts is such as to make positive contact with lamp pins at all times. Contacts can in no way become separated, bent, twisted or distorted causing faulty lamp pin contact as a result of lamp insertion and removal.

Specifications & Mounting Data

for Benjamin "Magna-Flo" Continuous Line Lighting Systems

Couplings — The coupling for connecting channel sections end-to-end is made of 20 gauge steel finished in baked gray enamel over a phosphorizing treatment that gives excellent corrosion protection. Coupling is easily inserted into the ends of the channel sections and locks securely in place. Overall coupling length is $9\frac{5}{8}$ inches which provides a $3\frac{5}{8}$ -inch spacing between channels; a $\frac{1}{4}$ -inch spacing between closed-end reflectors; and a $\frac{3}{8}$ -inch spacing between open-end reflectors.



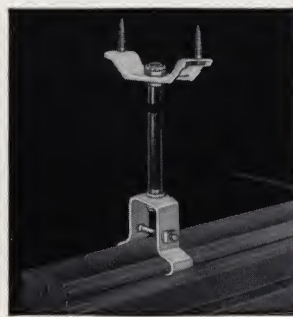
Sliding Ceiling Suspension
Cat. No. 18422



Sliding Cable Suspension
Cat. No. 18472



Sliding $\frac{3}{8}$ " Rod Suspension
Cat. No. 18439



Sliding $\frac{1}{2}$ " Conduit Suspension
Cat. No. 18443



Sliding Chain Suspension
Cat. No. 18449



Conduit or Rod
Mounting

End Caps — End Caps are constructed of 16 gauge steel finished in baked gray enamel over cadmium plate. End caps close the open ends of channel sections at either end of the line and are easily positioned by tightening two attaching screws. Each end cap is provided with a combination $\frac{1}{2}$ and $\frac{3}{4}$ -inch iron pipe size knockout.

Ballasts — All two-lamp channels are provided with a high power factor, twin-lamp, instant start slimline ballast. Three-lamp channels are provided with one twin-lamp and one single-lamp high power factor, instant-start slimline ballast. Ballasts regularly supplied are for 110-125V. or 220-250V., 60 cycle operation at 430 MA. and operate lamps out of phase to minimize cyclic light flicker.

Power Consumption — The table below lists the approximate total watts consumed by each size of "Magna-Flo" channel.

Single Section	No. of Lamps	Approx. Watts per Lamp	Approx. Total Watts
"Magna-Flo 48"	2	40	108
"Magna-Flo 72"	2	56	145
"Magna-Flo 96"	2	75	190
"Magna-Flo 48"	3	40	163
"Magna-Flo 72"	3	56	223
"Magna-Flo 96"	3	75	290

Provisions for Grounding — Metal to metal bond is provided between reflectors and housings for grounding.

MOUNTING DATA

Sliding Hanger Suspensions — This complete line of suspension fittings is designed to solve practically every mounting problem on ceilings having obstacles (pipes, ducts, beams, etc.) that interfere with lighting system suspension. See illustration at left and listings on page 374C-8.

Continuous grooves in each side of "Magna-Flo" channels and couplings allow the Clamping Yoke of these fittings to be positioned at any point. Suspensions are quickly and securely fastened to channels by tightening the single nut and bolt in the Clamping Yoke.

Conduit or Rod Mounting — The various sizes of "Magna-Flo" channels have a number of different sized knockouts that can be used for rigid conduit or rod mounting. See dimension drawings on page 374C-5 or table in "Channel" specifications on page 374C-2 for knockout sizes and center spacings.

ASSURED PERFORMANCE

Auxiliary control equipment is certified by Electrical Testing Laboratories and by the manufacturer. Ballasts and lamp holders are listed separately by Underwriters' Laboratories and complete units carry Underwriters' Laboratories Inspection Label.

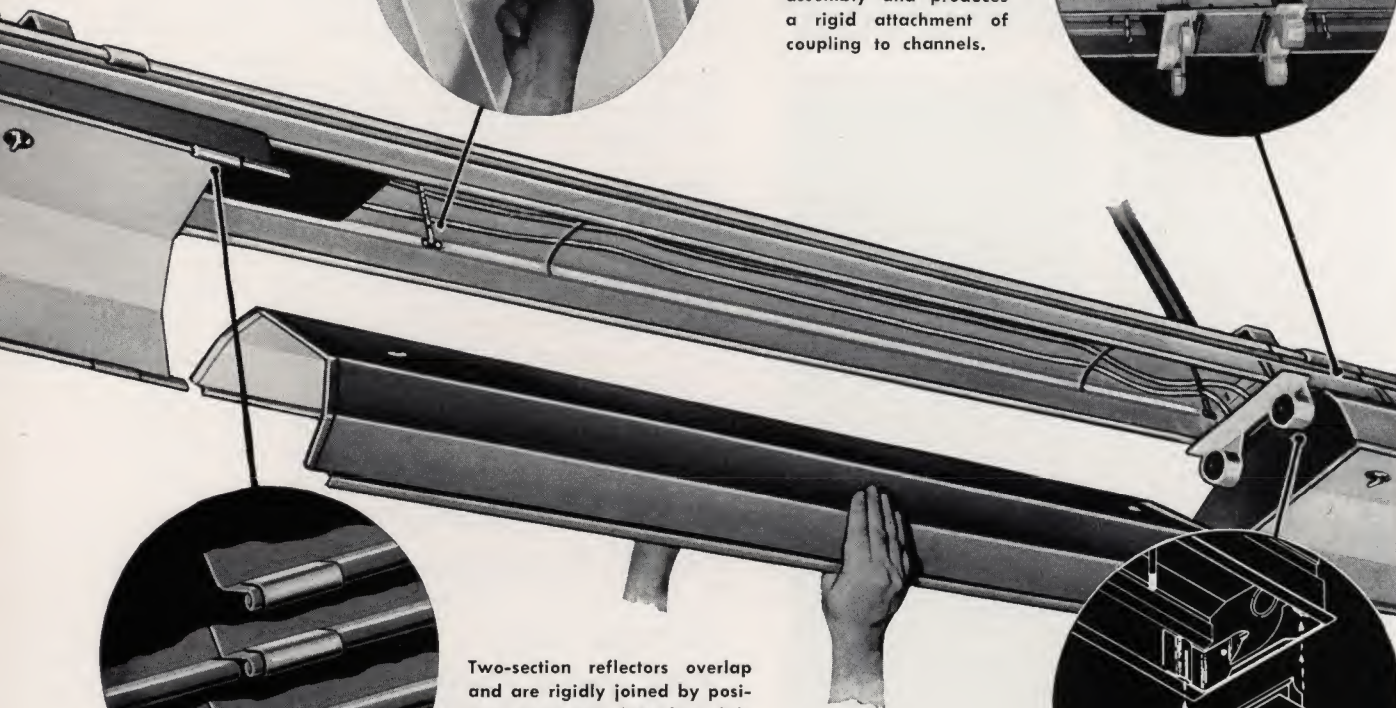
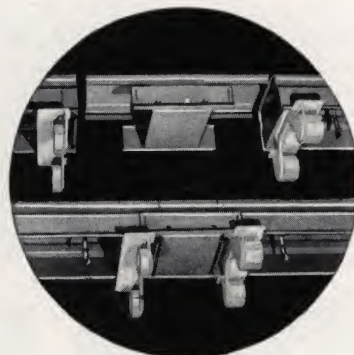
Installation Features

of Benjamin "Magna-Flo" Lighting Systems

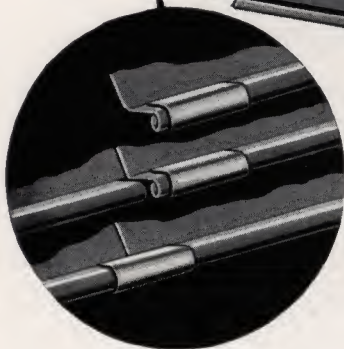
A quarter-turn of hand-operated "Lok-Latch" fasteners quickly fasten the reflectors to the channels.



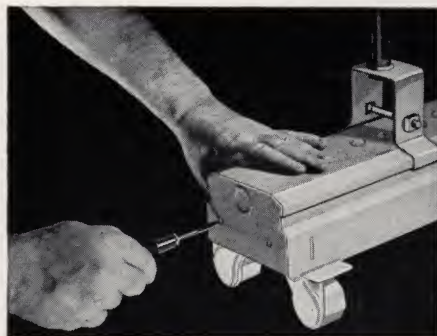
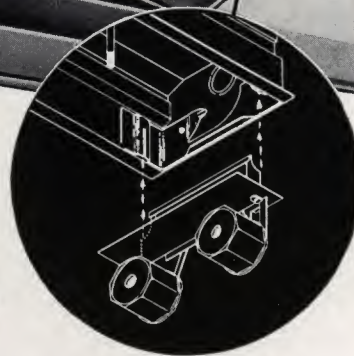
Channel couplings lock in place by means of four "shearing & slot" combinations. Tightening the two screws in the coupling completes the assembly and produces a rigid attachment of coupling to channels.



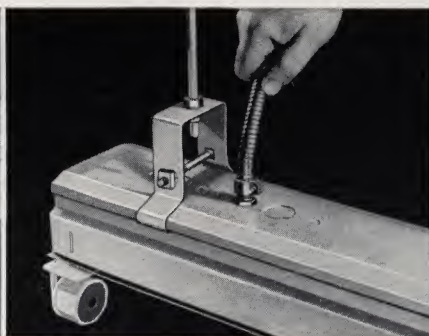
Two-section reflectors overlap and are rigidly joined by positive alignment clips that slide back and forth over the reflector bead.



"Springlox" lampholders snap, by hand, into slots in the channel bracket. These brackets are precisely and rigidly positioned in the channel.



End caps are easily fastened to channels by tightening two screws.



Knockouts in the top of the channel may be used for line wire entrances.



End cap has a combination 1/2 and 3/4-inch knockout for line wire entrances.

for "Magna-Flo 96", "Magna-Flo 72" and "Magna-Flo 48"

Technical drawing of a 100-inch folding door. The drawing shows the door in its folded position and an exploded view of its components. Key dimensions and labels include:

- Overall Length:** 100" (labeled as 99 7/8" for the closed end).
- Top Rail Dimensions:**
 - Total length: 96 5/8"
 - Distance from top edge to center of rollers: 87 3/4" C. - 1/2" I.P.K.O.
 - Distance from top edge to center of rollers (alternative): * 83 C. - 1/2" I.P.K.O.
 - Distance from top edge to center of rollers (alternative): * 80 C. - 3/4" I.P.K.O.
 - Roller diameter: 3/8" K.O.
 - End bracket dimensions: 1 1/2" & 3/4" I.P.K.O.
 - End bracket height: 2 31/32"
- Bottom Rail Dimensions:**
 - Height from bottom edge to top of rail: 7 3/16"
 - Height from bottom edge to top of rail (alternative): 4 7/32"
 - Height from bottom edge to top of rail (alternative): 13 1/8"
- Assembly Details:**
 - ASSEMBLED POSITION:** Indicated by arrows pointing to the top rail and bottom rail.
 - 1/2" I.P.K.O.:** Dimension for the top rail's internal part.
 - 3/8":** Dimension for the gap in the assembled position.
 - GAP IN ASSEMBLED POSITION:** Label for the 3/8" gap.
 - ASSEMBLED DIMENSION:** Label for the 4 7/32" dimension.

*Three-lamp channels have only one of this pair of knockouts.

Technical drawing of a 12' x 6' aluminum extrusion assembly. The drawing shows the extrusion in its assembled position and a side view of the closed end. Dimensions are given in inches.

ASSEMBLED POSITION

Labels and Dimensions:

- 3 5/8**: Dimension for the top flange.
- 72 5/8**: Overall length of the extrusion.
- 63 3/4 C. - 1/2" I.P.K.O.**: Dimension for the top flange to the center of the extrusion.
- 3/8 K.O.**: Dimension for the top flange to the center of the extrusion.
- *59 C. - 1/2" I.P.K.O.**: Dimension for the top flange to the center of the extrusion.
- *56 C. - 3/4" I.P.K.O.**: Dimension for the top flange to the center of the extrusion.
- 1/2 & 3/4 I.P.K.O.**: Dimension for the top flange to the center of the extrusion.
- 31/32**: Dimension for the top flange to the center of the extrusion.
- 2 3/16**: Dimension for the top flange to the center of the extrusion.
- 7 3/16**: Dimension for the top flange to the center of the extrusion.
- ASSEMBLED DIMENSION**: Label for the assembled dimension.
- 3 5/8**: Dimension for the top flange.
- 75 7/8**: Overall length of the extrusion.
- (CLOSED END 76")**: Dimension for the closed end of the extrusion.
- 13 1/8**: Dimension for the top flange to the center of the extrusion.
- 4 7/32**: Dimension for the top flange to the center of the extrusion.
- GAP IN ASSEMBLED POSITION**: Label for the gap in the assembled position.
- 3/8**: Dimension for the gap in the assembled position.

*Three-lamp channels have only one of this pair of knockouts.

Technical drawing of the 'B' Model of the 'A' Series, showing side and front views with dimensions.

Side View Dimensions:

- Overall length: $48\frac{5}{8}$
- Distance from front to first pin: $39\frac{3}{4}$ C. - $\frac{1}{2}$ I.P.K.O.
- Distance between pins: 35 C. - $\frac{1}{2}$ I.P.K.O.
- Pin diameter: $\frac{3}{8}$ K.O.
- Distance from second pin to rear: 32 C. - $\frac{3}{4}$ I.P.K.O.
- Rear pin diameter: $\frac{1}{2} \& \frac{3}{4}$ I.P.K.O.
- Rear pin offset: $2\frac{31}{32}$
- Height: $7\frac{3}{16}$

Front View Dimensions:

- Overall width: 52
- Open end width: $51\frac{7}{8}$
- Height: $4\frac{7}{32}$
- Gap in assembled position: $\frac{1}{4}$

Assembly Notes:

- ASSEMBLED POSITION (indicated by dashed lines and arrows for the side view).
- GAP IN ASSEMBLED POSITION (indicated for the front view).

†Dimensions are same for open-end units except where specifically mentioned.

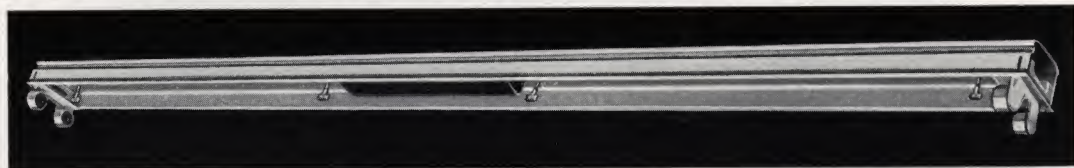
Channels Only for "Magna-Flo" Systems

for use with Reflectors listed on page 374C-7 (Specifications on page 374C-2)

Approved by Underwriters' Laboratories, Inc.

TYPE "E" CHANNELS (5-INCH LAMP CENTERS) WITHOUT END CAPS—WIRED WITH 6-INCH LEADS

Cat. No. 96502



For 96-inch, T12 Slimline Lamps

Voltage (60 Cycle)	No. of Lamps	Lamp Data		Length of Channels	Ballast (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price
		Approx. Current	Approx. Watts					
110-125V.	2	430MA.	75	96 $\frac{5}{8}$ "	One twin-lamp	31	96502	\$46.40
110-125V.	3	430MA.	75	96 $\frac{5}{8}$ "	One twin-lamp plus one single-lamp	44	96503	70.70
220-250V.	2	430MA.	75	96 $\frac{5}{8}$ "	One twin-lamp	31	96512	57.10
220-250V.	3	430MA.	75	96 $\frac{5}{8}$ "	One twin-lamp plus one single-lamp	44	96513	89.10
.....	.....	.....	.....	96 $\frac{5}{8}$ "	Blank Channel—No ballast or lamp holders	11 $\frac{1}{2}$	96588	13.20
.....	.....	.....	.....	96 $\frac{5}{8}$ "	Cover for Blank Channel (Two-Piece)	7 $\frac{1}{2}$	96590	3.60

Cat. No. 72502



For 72-inch, T12 Slimline Lamps

Voltage (60 Cycle)	No. of Lamps	Lamp Data		Length of Channels	Ballast (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price
		Approx. Current	Approx. Watts					
110-125V.	2	430MA.	56	72 $\frac{5}{8}$ "	One twin-lamp	24	72502	\$41.80
110-125V.	3	430MA.	56	72 $\frac{5}{8}$ "	One twin-lamp plus one single-lamp	34	72503	65.80
220-250V.	2	430MA.	56	72 $\frac{5}{8}$ "	One twin-lamp	24	72512	51.20
220-250V.	3	430MA.	56	72 $\frac{5}{8}$ "	One twin-lamp plus one single-lamp	34	72513	83.20
.....	.....	.....	.....	72 $\frac{5}{8}$ "	Blank Channel—No ballast or lamp holders	9	72588	9.90
.....	.....	.....	.....	72 $\frac{5}{8}$ "	Cover for Blank Channel (Two Piece)	5 $\frac{1}{2}$	72590	2.70

Cat. No. 48502



For 48-inch, T12 Slimline Lamps

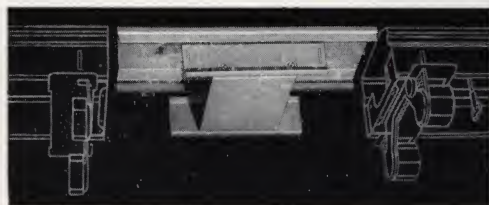
Voltage (60 Cycle)	No. of Lamps	Lamp Data		Length of Channels	Ballast (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price
		Approx. Current	Approx. Watts					
110-125V.	2	430MA.	40	48 $\frac{5}{8}$ "	One twin-lamp	18 $\frac{1}{2}$	48502	\$26.80
110-125V.	3	430MA.	40	48 $\frac{5}{8}$ "	One twin-lamp plus one single-lamp	29 $\frac{1}{2}$	48503	46.80
220-250V.	2	430MA.	40	48 $\frac{5}{8}$ "	One twin-lamp	18 $\frac{1}{2}$	M-48512	33.50
220-250V.	3	430MA.	40	48 $\frac{5}{8}$ "	One twin-lamp plus one single-lamp	29 $\frac{1}{2}$	M-48513	59.90
.....	.....	.....	.....	48 $\frac{5}{8}$ "	Blank Channel—No ballast or lamp holders	6	48588	6.60
.....	.....	.....	.....	48 $\frac{5}{8}$ "	Cover for Blank Channel	3 $\frac{1}{4}$	48590	1.80

Lamps not included.

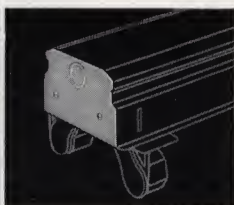
Parts, Reflectors for "Magna-Flo" Systems

for use with "Magna-Flo" Channels listed on page 374C-6 (Specifications on page 374C-2)

Approved by Underwriters' Laboratories, Inc.



Cat. No. 9601

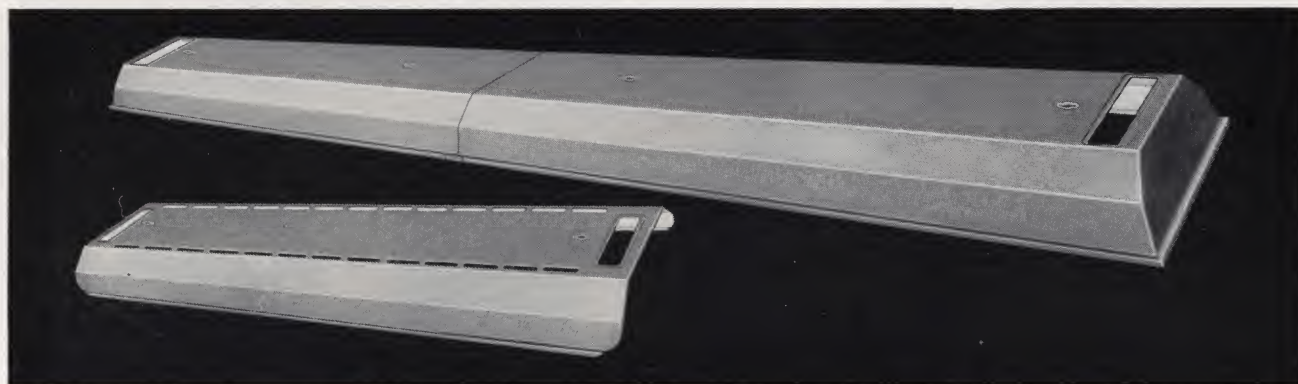


Cat. No. 18425

CHANNEL PARTS

Description	Net Wt. Lbs. Ea.	Cat. No.	List Price
Channel End Cap	1/2	18425	\$0.40
Channel Coupling	1 1/4	9601	1.20

TYPE "E" PORCELAIN ENAMELED STEEL REFLECTORS (13 1/8-INCH WIDTH)—
FOR EITHER 2 OR 3-LAMP SYSTEMS



Cat. No. M-4812

Cat. No. M-9620

For 96-inch, T12 Slimline Lamps

Dimensions—Inches			Description	Net Wt. Lbs. Ea.	Without Apertures		With Apertures	
Length	Width	Height			Cat. No.	List Price	Cat. No.	List Price
100	13 1/8	4 1/4	Closed-End (Two-Piece)	21	M-9620	\$20.80	M-9622	\$22.40
99 7/8	13 1/8	4 1/4	Open-End (Two-Piece)	19 1/2	M-9610	16.80	M-9612	18.40

For 72-inch, T12 Slimline Lamps

Dimensions—Inches			Description	Net Wt. Lbs. Ea.	Without Apertures		With Apertures	
Length	Width	Height			Cat. No.	List Price	Cat. No.	List Price
76	13 1/8	4 1/4	Closed-End (Two-Piece)	17	M-7220	\$17.40	M-7222	\$18.60
75 7/8	13 1/8	4 1/4	Open-End (Two-Piece)	15 1/2	M-7210	13.40	M-7212	14.60

For 48-inch, T12 Slimline Lamps

Dimensions—Inches			Description	Net Wt. Lbs. Ea.	Without Apertures		With Apertures	
Length	Width	Height			Cat. No.	List Price	Cat. No.	List Price
52	13 1/8	4 1/4	Closed-End	11 1/2	M-4820	\$11.60	M-4822	\$12.40
51 7/8	13 1/8	4 1/4	Open-End	10	M-4810	8.40	M-4812	9.20

Sliding Hanger Suspension Fittings

For Continuous Line "Magna-Flo" Systems

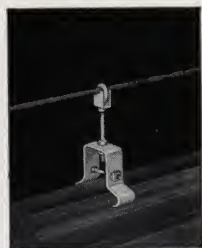
Building construction obstacles (beams, skylights, sprinkler heads, cranes, etc.) cause little trouble when suspending Benjamin "Magna-Flo" Systems. This ease of suspension results from the continuous groove in all channel sections and couplings that take the various Benjamin sliding-hanger suspension fittings illustrated on this page.

Suspensions are securely fastened (by tightening a single nut and bolt) at any point along the continuous groove. Where obstructions permit, however, position one sliding hanger at each coupling and one at each end of the fluorescent line.

Sliding Messenger Cable Suspension

Consists of No. 18471 Messenger Cable Hook and a No. 18420 Clamping Yoke.

Hook fits all cable up to 7/16" inclusive, which can be run parallel to or at right angles to channels.



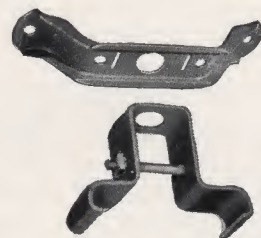
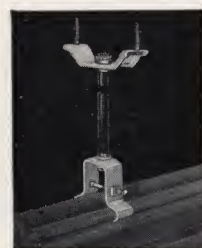
Cat. No. 18472

Description	Cat. No.	List Price
Complete Suspension	18472	\$1.90
Suspension Less Cable Hook	18420	.70
Messenger Cable Hook Only*	18471	1.20

*Can be used independently by bolting directly to 1/2-inch diameter knockouts provided in top of channel.

Sliding 1/2-Inch Conduit Suspension

Consists of a No. 18441 Offset Ceiling Strap and a No. 18415 Clamping Yoke.



Cat. No. 18443

Description	Cat. No.	List Price
Complete Suspension for 1/2" Conduit*	18443	\$1.20
Suspension Less Ceiling Strap for 1/2" Conduit*	18415	.70
Offset Ceiling Strap Only	18441	.50

* 1/2" Conduit not supplied.

Sliding Chain Suspension



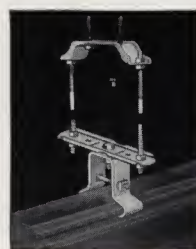
Cat. No. 18449

Description	Cat. No.	List Price
Complete Suspension*	18449	\$0.90
Hook Assembly Only	18448	.20
Suspension Less Hook	18420	.70

*Chain not supplied. Lock link Chain is recommended.

Sliding Twin-Rod Suspension and Sliding Ceiling Suspension

Consists of One No. 18431 Offset Ceiling Strap, One No. 18432 Flat Ceiling Strap and a No. 18420 Clamping Yoke.



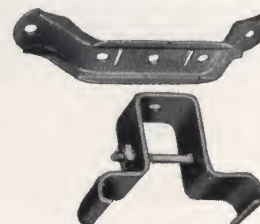
Cat. No. 18422

Description	Cat. No.	List Price
Complete Twin-Rod Suspension*	18422	\$1.70
Complete Ceiling Suspension	18423	1.20
Suspension Less Ceiling Strap*	18420	.70
Offset Ceiling Strap Only	18431	.50
Flat Ceiling Strap with 25/64" Center Hole	18432	.50

*Rods not supplied.

Sliding 3/8-Inch Single-Rod

Consists of No. 18431 Strap and No. 18420 Clamping Yoke.



Cat. No. 18439

Description	Cat. No.	List Price
Complete Suspension*—3/8" Rod not supplied	18439	\$1.20
Suspension Less Ceiling Strap for 3/8" Rod*	18420	.70
Offset Ceiling Strap Only	18431	.50

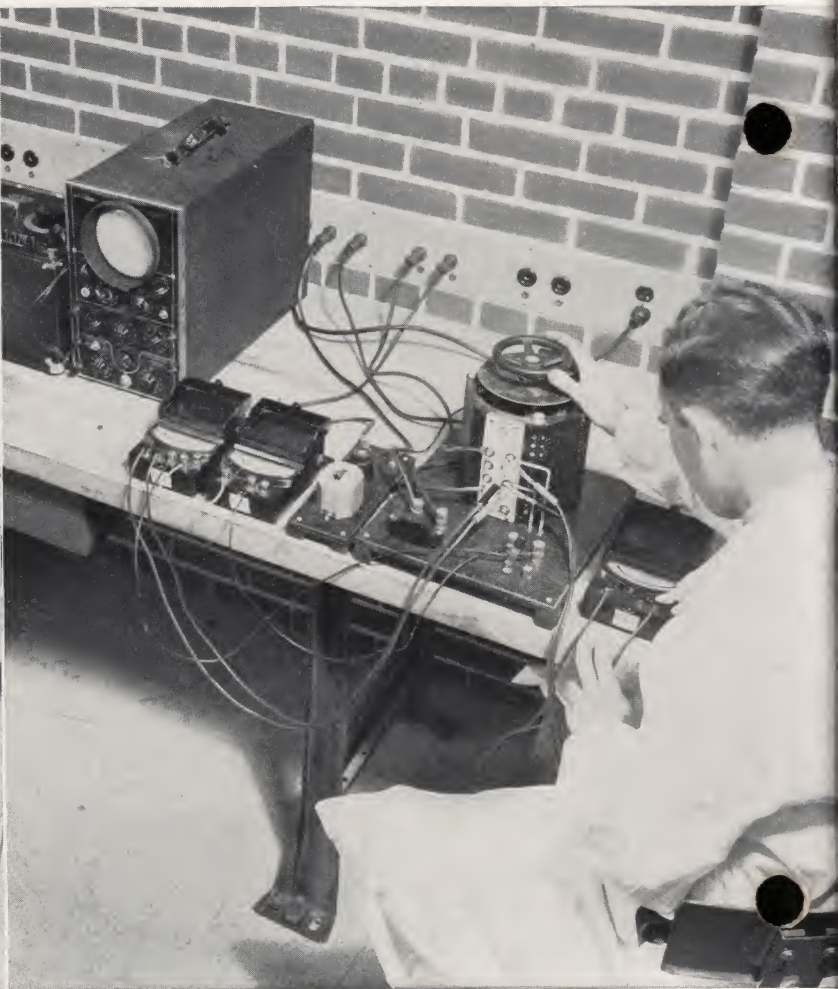
* Attaches directly to ceiling if bolt is substituted for rod.

numerical index

Catalog Number	Page Number
M-2102	374 B-6
M-2103	374 B-6
M-2112	374 B-6
M-2113	374 B-6
M-4810	374C-7
M-4812	374C-7
M-4820	374C-7
M-4822	374C-7
4832	374 B-10
4834	374 B-10
4892	374 B-10
4894	374 B-10
4896	374 B-10
4897	374 B-10
4898	374 B-10
4899	374 B-10
5243	374 B-10
5261	374 B-10
5262	374 B-10
M-6102	374 B-4
M-6103	374 B-4
M-6112	374 B-4
M-6113	374 B-4
M-7210	374C-7
M-7212	374C-7
M-7220	374C-7
M-7222	374C-7
M-7232	374 B-10
7234	374 B-10
M-8102	374 B-8
M-8103	374 B-8
M-8112	374 B-8
M-8113	374 B-8
9601	374C-7
M-9610	374C-7
M-9612	374C-7
M-9620	374C-7
M-9622	374C-7
9632	374 B-10
9634	374 B-10

Catalog Number	Page Number
18415	374C-8
18420	374C-8
18422	374C-8
18423	374C-8
18425	374C-8
18431	374C-8
18432	374C-8
18439	374C-8
18441	374C-8
18443	374C-8
18448	374C-8
18449	374C-8
18471	374C-8
18472	374C-8
48102	374 B-9
48103	374 B-9
M-48112	374 B-9
M-48113	374 B-9
48122	374 B-9
48123	374 B-9
M-48132	374 B-9
M-48133	374 B-9
48202	374 B-8
48203	374 B-8
48212	374 B-8
48213	374 B-8
48222	374 B-8
48223	374 B-8
48232	374 B-8
48233	374 B-8
48502	374C-6
48503	374C-6
M-48512	374C-6
M-48513	374C-6
48588	374C-6
48590	374C-6
72102	374 B-7
72103	374 B-7
72112	374 B-7
72113	374 B-7

Catalog Number	Page Number
72122	374 B-7
72123	374 B-7
72132	374 B-7
72133	374 B-7
72202	374 B-6
72203	374 B-6
72212	374 B-6
72213	374 B-6
72222	374 B-6
72223	374 B-6
72232	374 B-6
72233	374 B-6
72502	374C-6
72503	374C-6
72512	374C-6
72513	374C-6
72588	374C-6
72590	374C-6
96102	374 B-5
96103	374 B-5
96112	374 B-5
96113	374 B-5
96122	374 B-5
96123	374 B-5
96132	374 B-5
96133	374 B-5
96202	374 B-4
96203	374 B-4
96212	374 B-4
96213	374 B-4
96222	374 B-4
96223	374 B-4
96232	374 B-4
96233	374 B-4
96502	374C-6
96503	374C-6
96512	374C-6
96513	374C-6
96588	374C-6
96590	374C-6



**You can
SPECIFY "BENJAMIN"
with confidence**

The above pictures were taken in the Benjamin Testing and Development Laboratory. They show just two of the many test projects that go on week after week—projects that allow you to specify "Benjamin" with confidence.

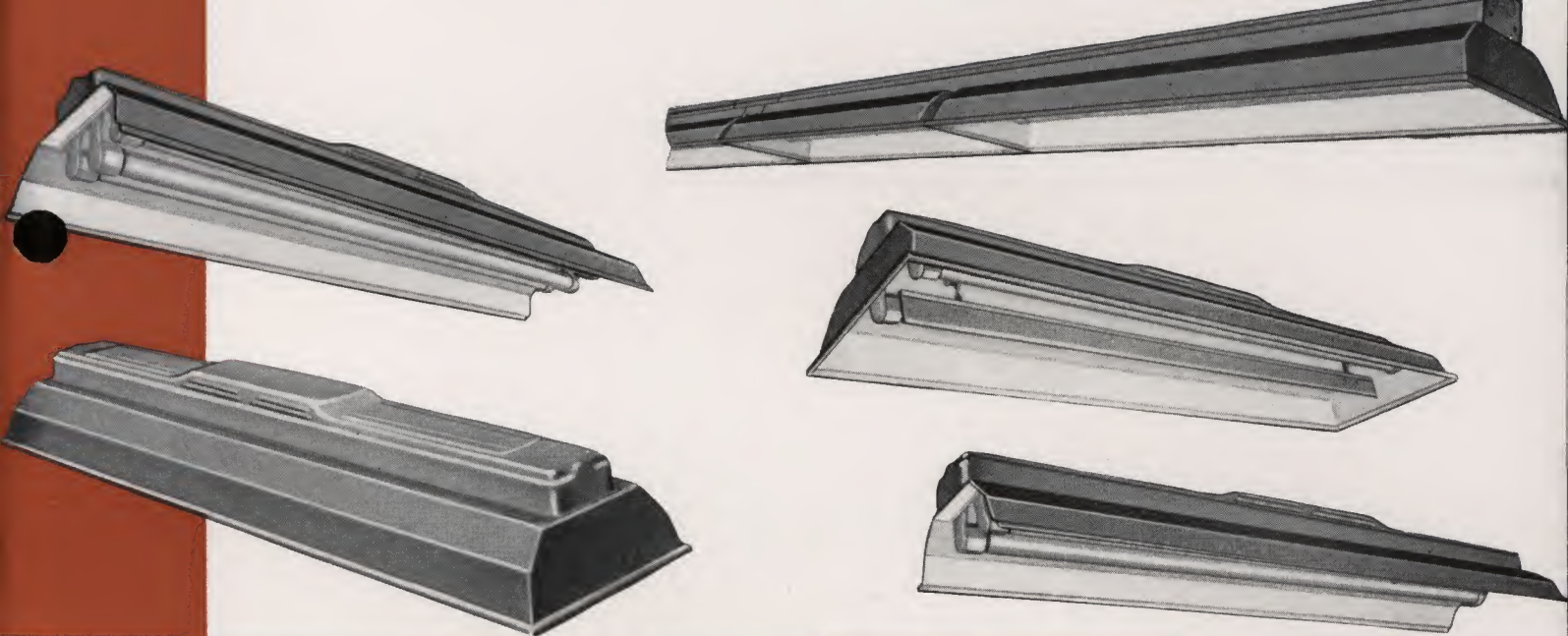
Each new Benjamin product passes through a gruelling set of tests before it is released to the market . . . as free of "bugs" as is humanly possible to attain.

One of the continuous projects in the Benjamin Laboratory is quality control. Even after a product is in production, continual tests make sure that production samples are as good as development models.

So . . . if you want to specify lighting equipment with complete confidence in its high performance and long, trouble-free life . . . you can specify "Benjamin."



Benjamin Testing and Development Laboratory



BENJAMIN ELECTRIC MFG. COMPANY

DES PLAINES, ILLINOIS

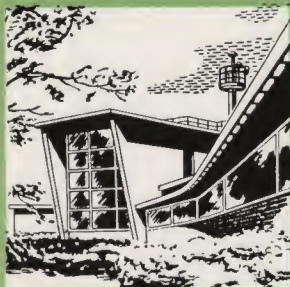
NEW YORK
230-34 W. 17th St.

CHICAGO
20 North Wacker Dr.

SAN FRANCISCO
829 Folsom St.

AD 5705 17M 12-50

Printed in U.S.A.



Benjamin Testing and
Development Laboratory

Benjamin "MAGNA-FLO" Lighting Systems with PORCELAIN ENAMELED CHANNELS

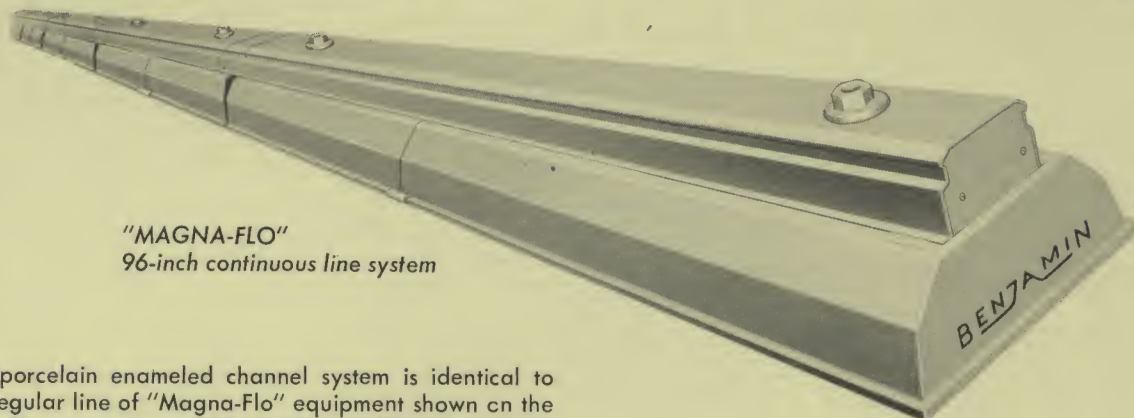
for 96, 72 and 48-inch T12 Slimline Lamps

Approved by Underwriters' Laboratories, Inc.

BENJAMIN

**advance
catalog
information**

No. A-5



"MAGNA-FLO"
96-inch continuous line system

This porcelain enameled channel system is identical to the regular line of "Magna-Flo" equipment shown on the preceding pages except for slight modifications in the steel channels and in finishes. This system is recommended in those sections of textile mills, paper mills, food plants, laundries, meat packing plants, etc. where excessive moisture is present. In such locations water tends to accumulate on the top surfaces of the lighting equipment making it imperative to provide channels with a corrosion proof finish such as porcelain enamel.

LIGHTING DATA

Two and three-lamp units have a shielding angle of 13 degrees. Reflectors have a minimum reflection factor of 82%.

SPECIFICATIONS

Channels—Fabricated of 20 gauge steel, finished inside and out with durable, gray porcelain enamel. Channels contain control equipment for operating either two or three fluorescent lamps plus Benjamin, Metal-clad "Springlox" lampholders for single-pin lamps. Channels are supplied wired with 6-inch leads.

Complete channels are available with one, two or without suspension flanges tapped $\frac{1}{2}$ -inch standard, $\frac{3}{4}$ -inch if specified. There are no other indentations or knockouts in the tops of these channels.

Reflectors—Formed of 20 gauge steel completely covered with Benjamin lifetime porcelain enamel—outer surfaces are finished gray; reflecting surfaces are finished white. All reflector styles can be detached from channels by a quarter turn of several hand-operated "Lok-Latch" fasteners.

Reflectors for 48-inch lamps are one-piece. Reflectors for 72-inch and 96-inch lamps are made in two sections

for easy handling. The two sections overlap $\frac{3}{4}$ -inch and are rigidly connected by a positive aligning clip that slides quickly into place over the reflector beads.

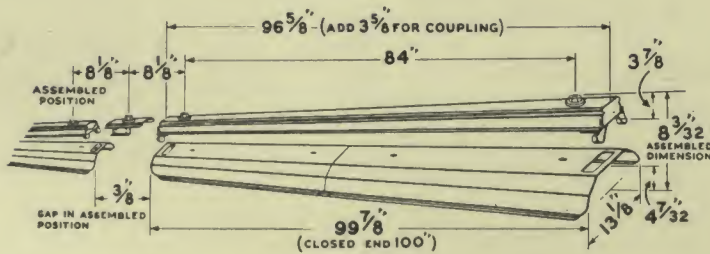
Lampholders—Lampholder bodies are constructed of metal. Twin lampholders give 5-inch lamp spacing and triple lampholders, $2\frac{1}{2}$ -inch spacing. All non-current carrying metal parts are zinc plated and when exposed are iridited so that the finish coat of white baked paint enamel will adhere firmly and undersurface will not bleed.

This lampholder bears Underwriters' Laboratories approval. Slimline lampholders incorporate a cut-out type terminal switch, so designed as to open the primary circuit when only one end of any slimline lamp is removed from the lighting unit.

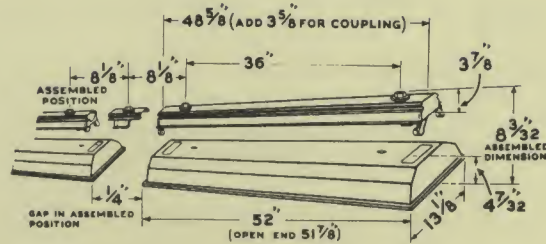
The design of this cutout-type terminal switch and other lamp contacts provides positive contact with lamp pins at all times. Contacts cannot become separated, bent, twisted or distorted causing faulty lamp pin contact as a result of lamp insertion and removal.

Couplings—Couplings are made of 20 gauge steel finished in baked gray enamel over zinc plate. Coupling provides a $3\frac{3}{8}$ inch spacing between channels. Coupling has a jumper wire with "U" shaped terminals at each end for attaching to screw terminal in channels. Jumper wire provides a continuous circuit for grounding channels. Couplings are supplied with or without a suspension flange, tapped $\frac{1}{2}$ ", or $\frac{3}{4}$ " if specified.

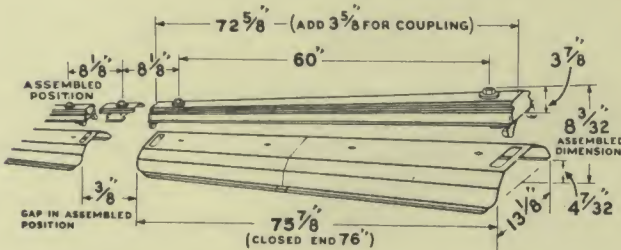
"MAGNA-FLO" Porcelain Enameled Channel Systems



MAGNA-FLO 96 (above); MAGNA-FLO 72 (below)—Dimensions are same for closed-end units except where specifically mentioned.



MAGNA-FLO 48—Dimensions are same for open-end units except where specifically mentioned.



End Caps—End Caps are constructed of 16 gauge steel finished in baked gray enamel over zinc plate. End caps close the open ends of channel sections at either end of the line and are easily positioned by tightening two attaching screws. End caps do not have knockouts.

Ballasts—Ballasts regularly supplied are H.P.F., instant-start, LEAD-LAG for slimline lamps. Two-lamp channels have twin-lamp ballasts; triple-lamp channels have one twin-lamp plus one single lamp ballast. SEQUENCE-START SERIES ballasts are also available as optional equipment. To order, suffix "SER" to any channel number listed below. Two-lamp channels have twin-lamp series ballasts; three-lamp channels have one twin-lamp, series ballast and one single-lamp lead-lag ballast. All ballasts are supplied for 110-125V. or 220-250V., 60 cycle operation at 430MA.

TYPE "E" PORCELAIN ENAMELED CHANNELS WITHOUT END CAPS (5-inch lamp centers)†

For 96-inch, T-12 Slimline Lamps

Voltage (60 cycles)	No. of Lamps	Ballast (High Power Factor)	Without Flanges		With One Flange*		With Two Flanges*	
			Net Wt. Lbs. Each	Cat. No.	Net Wt. Lbs. Each	Cat. No.	Net Wt. Lbs. Each	Cat. No.
110-125V.	2	Twin-lamp	31 1/2	96602	31 3/4	96702	32	96802
110-125V.	3	Twin plus single-lamp	44 1/2	96603	44 3/4	96703	45	96803
220-250V.	2	Twin-lamp	31 1/2	96612	31 3/4	96712	32	96812
220-250V.	3	Twin plus single-lamp	44 1/2	96613	44 3/4	96713	45	96813

For 72-inch, T-12 Slimline Lamps

110-125V.	2	Twin-lamp	24 1/2	72602	24 3/4	72702	25	72802
110-125V.	3	Twin plus single-lamp	34 1/2	72603	34 3/4	72703	35	72803
220-250V.	2	Twin-lamp	24 1/2	72612	24 3/4	72712	25	72812
220-250V.	3	Twin plus single-lamp	34 1/2	72613	34 3/4	72713	35	72813

For 48-inch, T-12 Slimline Lamps

110-125V.	2	Twin-lamp	19	48602	19 1/4	48702	19 1/2	48802
110-125V.	3	Twin plus single-lamp	30	48603	30 1/4	48703	30 1/2	48803
220-250V.	2	Twin-lamp	19	48612	19 1/4	48712	19 1/2	48812
220-250V.	3	Twin plus single-lamp	30	48613	30 1/4	48713	30 1/2	48813

TYPE "E", RLM, PORCELAIN ENAMELED REFLECTORS—13 1/8" WIDE

Lamp Size	Open-End Reflectors				Closed-End Reflectors			
	Without Apertures		With Apertures		Without Apertures		With Apertures	
	Net Wt.	Cat. No.	Net Wt.	Cat. No.	Net Wt.	Cat. No.	Net Wt.	Cat. No.
96-inch, T-12	19 1/2	M-9610	18 3/4	M-9612	21	M-9620	20 1/4	M-9622
72-inch, T-12	15 1/2	M-7210	15	M-7212	17	M-7220	16 1/2	M-7222
48-inch, T-12	10	M-4810	9 3/4	M-4812	11 1/2	M-4820	11 1/4	M-4822

PARTS FOR ASSEMBLY

Description	Net Wt. Lbs. Each	Cat. No.
Channel coupling (with suspension flange)	1 1/2	9607
Channel Coupling (without suspension flange)	1 1/4	9608
End Cap	1/2	18324

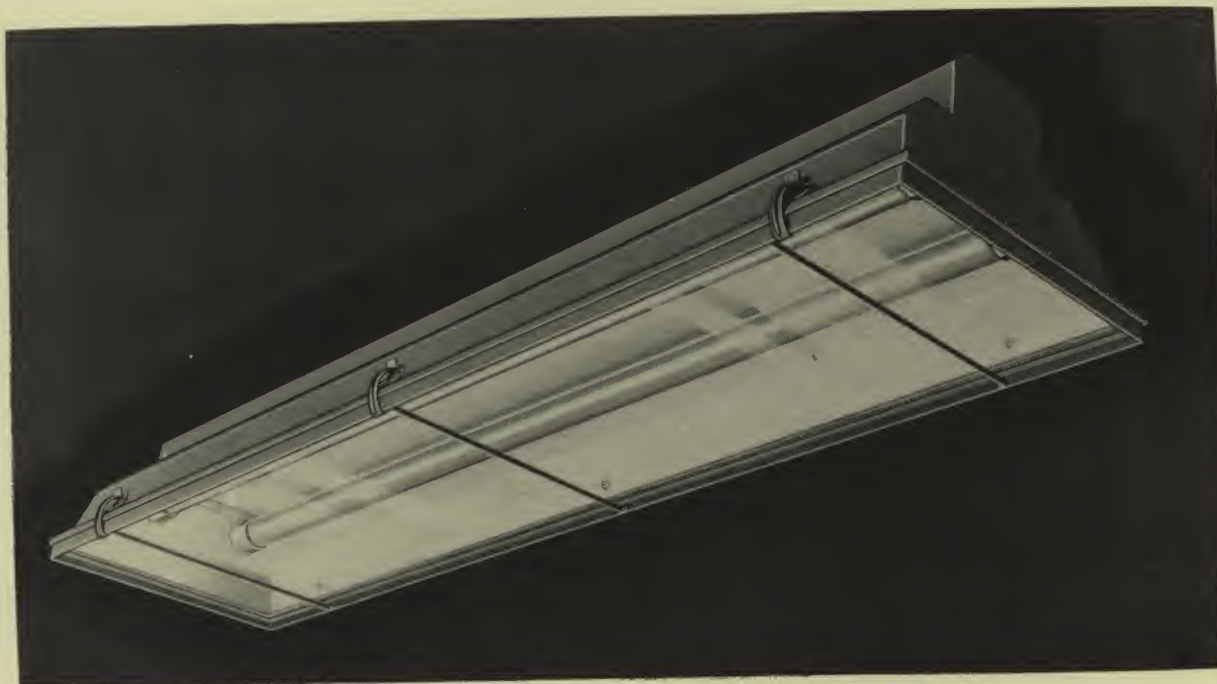
†Lamp not included.

*Flanges are tapped 1/2-inch standard; 3/4-inch if specified.

Schedule 2-F

BENJAMIN ELECTRIC MFG. COMPANY • Des Plaines, Illinois

Benjamin Type II-G "SEALED-FLO 48" Dust-Tight Units for Slimline Lamps



Listed by Underwriters' Laboratories, Inc., for
Class II (Groups F and G) and Class III Hazardous
Locations

These enclosed lighting units for slimline lamps are practically the same as the Benjamin Type II-G "Sealed-Flo 40" units for bipin lamps. The main difference is the incorporation of the new and exclusive Benjamin "Springlox" lamp holder for slimline lamps.

Type II-G "Sealed-Flo 48" Units satisfy all Underwriters' requirements for installation in Class II, Group F hazardous locations (atmospheres containing carbon black, coal or coke dust); Class II, Group G locations (atmospheres containing grain dust, such as flour and feed mills, grain elevators, starch and sugar mills); Class III locations (such as some parts of cotton and textile mills, cotton gins, cotton seed mills and wood-working plants).

SPECIFICATIONS

Lighting Data — The design of the reflector, high reflection factor (exceeding 82%) of the porcelain enamel and other factors combine to give an efficiency of 68% or more of the output of the lamps for twin-lamp units and 64% or more for triple-lamp units. All units have a 16-degree shielding angle.

One-piece Reflector-Housing—Reflector-housing is of welded steel construction finished in enduring porcelain enamel. The top of the reflector is formed by a porcelain enameled steel plate, which is removed for access to the control equipment (mounted on the inside top of the reflector-housing) by loosening two screws.

Cover—The steel cover frame is hinged to one side of the housing by three spring bronze hinges. Three hand operated, spring-type "C"-shaped clamps support the other side of the cover. The special "U" shaped, wire-reinforced, woven asbestos gasket and glass are held firmly in the frame by sixteen specially designed metal clips.

Lamp Holders — Lamp holders for slimline fluorescent lamps are constructed of metal. Twin lamp holders give 5-inch lamp spacing and triple lamp holders, 2½-inch spacing. All noncurrent carrying metal parts are electro-plated and when exposed are iridized so that the finish coat of white baked paint enamel will adhere firmly and under-surface will not bleed.

(Over)

(Issued December 1, 1950)

Temporary page 374 E-1

Benjamin Type II-G "SEALED-FLO 48" Dust-Tight Units for Slimline Lamps

This lamp holder bears Underwriters' Laboratories approval. Slimline lamp holders incorporate a cutout type terminal switch, so designed as to open the primary circuit when only one end of any slimline lamp is removed from the lighting unit.

The design of this cutout type terminal switch and other lamp contacts is such as to make positive contact with lamp pins at all times. Contacts can in no way become separated, bent, twisted or distorted causing faulty lamp pin contact as a result of lamp insertion and removal.

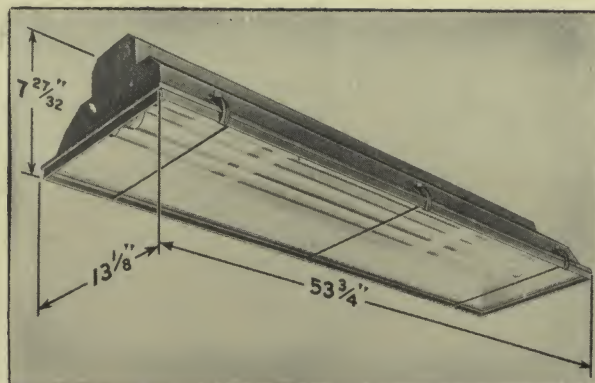
Ballasts — Two and three-lamp units are listed with high power factor, instant-starting, slimline ballasts.

Power Consumption — Twin-lamp units with lamps use approximately 108 watts. Three-lamp units with lamps use approximately 163 watts.

Wiring — All units are wired and have 6-inch leads.

Provision for Grounding—Metal to metal bonds ground unit through conduit system.

Finish — Housing is finished in porcelain enamel: gray outside; reflecting surfaces are a special diffusing white. Suspension flanges are finished in baked gray enamel over electro-plating and cover frames in baked gray enamel over zinc chromate. All other metal fittings are electro-plated. Lamp holders are finished in white enamel, over iridifing and electro-plating.



Two-lamp and three-lamp units
have same dimensions

MOUNTING

Units have two cast iron suspension flanges with conduit stops spaced on 47½-inch centers, tapped ½-inch iron pipe size; ¾-inch, if specified. One is for a dummy conduit stem and the other is for wire entrance.

TWO-LAMP UNITS* • Wired with 6-inch leads

Complete with Double-Strength, Grade A, Clear Glass Covers

Line Voltage (60 Cycle)	Lamp Data		Ballasts (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price*
	Approx. Current	Approx. Watts				
110-125V.	430MA.	2-40	One twin-lamp	47¼	46462-CL	
220-250V.	430MA.	2-40	One twin-lamp	47¼	46482-CL	

Complete with Tempered Plate Clear Glass Covers

110-125V.	430MA.	2-40	One twin-lamp	49¼	46462-TP	
220-250V.	430MA.	2-40	One twin-lamp	49¼	46482-TP	

THREE-LAMP UNITS* • Wired with 6-inch leads

Complete with Double-Strength, Grade A, Clear Glass Covers

Line Voltage (60 Cycle)	Lamp Data		Ballasts (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price*
	Approx. Current	Approx. Watts				
110-125V.	430MA.	3-40	One twin plus one single-lamp	58¼	46463-CL	
220-250V.	430MA.	3-40	One twin plus one single-lamp	58¼	46483-CL	

Complete with Tempered Plate Clear Glass Covers

110-125V.	430MA.	3-40	One twin plus one single-lamp	60¼	46463-TP	
220-250V.	430MA.	3-40	One twin plus one single-lamp	60¼	46483-TP	

COVER GLASSES FOR REPLACEMENT

Description	Cat. No.	List Price*
Double-Strength, Grade A, Clear Glass with Asbestos Gasket and Metal Clips	8434	
Tempered Plate, Clear Glass with Asbestos Gasket and Metal Clips	8435	

Wire Glass Covers—To order, suffix "WG" in place of "CL" on Catalog Numbers for units with Double-Strength, Grade A, Clear Glass Covers. Prices on application.

Lamps not supplied.

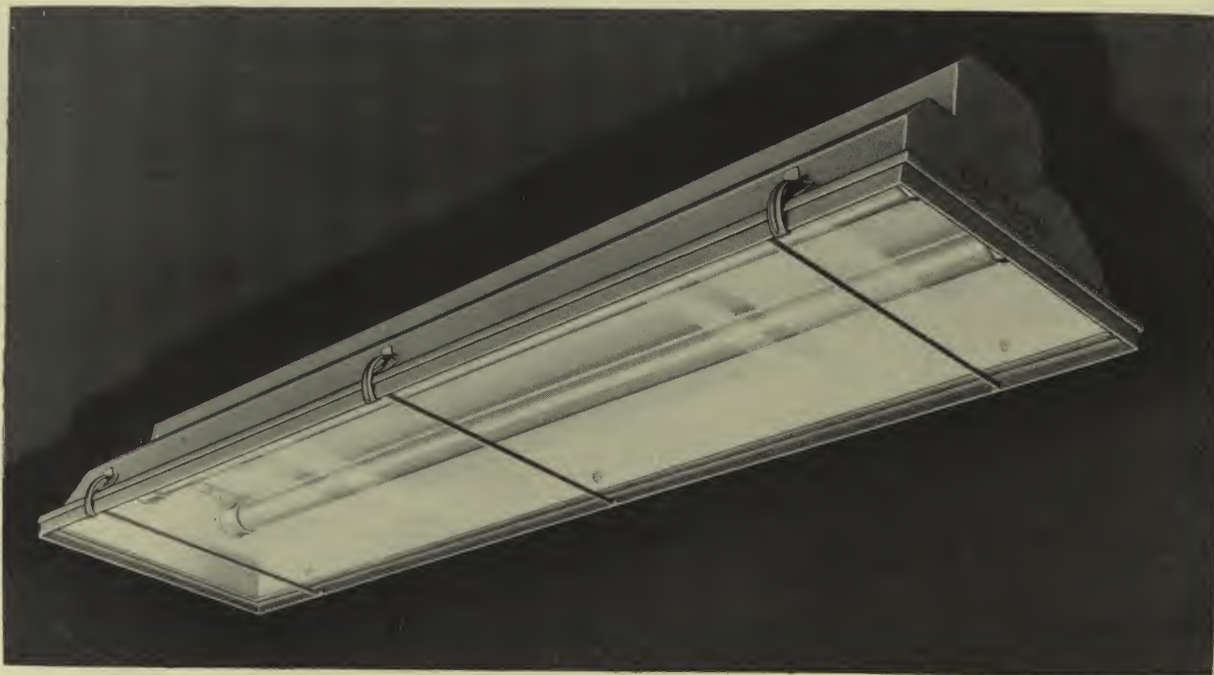
*For Prices see current "Fluorescent Net Price List" and Supplements

*Schedule 2-F.

Benjamin "VAPOR-TITE 48" Lighting Units for Slimline Lamps

Approved as Vapor-Tight by Underwriters' Laboratories, Inc.

NO. A-3



These enclosed, porcelain enameled units are versions of the popular "Vapor-Tite 40" bipin units that have been modified to take slimline lamps.

"Vapor-Tite 48" units are ideally suited to lighting meat packing plants, bottling plants, laundries or any location that has large amounts of non-combustible vapors or dust present in the atmosphere. The rubber-gasketed cover that seals the mouth of the reflector is designed to give easy access to the unit for relamping or other maintenance.

SPECIFICATIONS

Lighting Data—The design of the reflector, high reflection factor (exceeding 82%) of the porcelain enamel and other factors combine to give an efficiency of 68% or more of the output of the lamps for twin-lamp units and 64% or more for triple-lamp units. All units have a 16-degree shielding angle.

One-piece Reflector-Housing—Reflector-housing is of welded steel construction finished in enduring porcelain enamel. The top of the reflector is formed by a porcelain enameled steel plate, which is removed for access to the control equipment (mounted on the inside top of the reflector-housing) by loosening two screws.

Cover—The steel cover frame is hinged to one side of the housing by three spring bronze hinges. Three hand-operated, spring-type "C"-shaped clamps support the other side of the cover. The special "U"-shaped, extruded rubber gasket and glass are held firmly in the frame by sixteen specially designed metal clips.

Lamp Holders—Lamp holders for slimline fluorescent lamps are constructed of metal. Twin lamp holders give 5-inch lamp spacing and triple lamp holders, 2½-inch spacing. All noncurrent carrying metal parts are electro-plated and when exposed are iridized so that the finish coat of white baked paint enamel will adhere firmly and under-surface will not bleed.

This lamp holder bears Underwriters' Laboratories approval. Slimline lamp holders incorporate a cutout type terminal switch, so designed as to open the primary circuit when only one end of any slimline lamp is removed from the lighting unit.

The design of this cutout type terminal switch and other lamp contacts is such as to make positive contact with lamp pins at all times. Contacts can in no way become separated, bent, twisted or distorted causing faulty lamp pin contact as a result of lamp insertion and removal.

(Over)

(Issued December 1, 1950)

Temporary page 374F-1

Benjamin "VAPOR-TITE 48" Lighting Units for Slimline Lamps

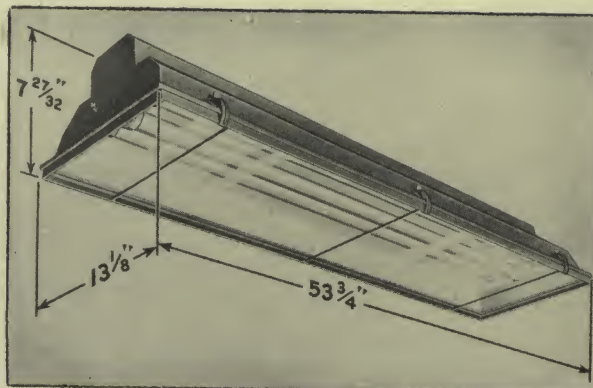
Ballasts—Two and three-lamp units are listed with high power factor, instant starting, slimline ballasts.

Power Consumption—Twin-lamp units with lamps use approximately 108 watts. Three-lamp units with lamps use approximately 163 watts.

Provision for Grounding—Metal to metal bonds ground unit through conduit system.

Wiring—All units are wired and have 6-inch leads.

Finish—Housing is finished in porcelain enamel; gray outside; reflecting surfaces are a special diffusing white. Suspension flanges are finished in baked, gray enamel over electro-plating and cover frames in baked gray enamel over zinc chromate. All other metal fittings are electro-plated. Lamp holders are finished in white enamel over iridizing and electro-plate.



Two-lamp and three-lamp units have same dimensions

MOUNTING

Units have two cast iron suspension flanges with conduit stops spaced on 47 1/2-inch centers, tapped 1/2-inch iron pipe size; 3/4-inch, if specified. One is for a dummy conduit stem and the other is for wire entrance.

TWO-LAMP UNITS*—Wired with 6-inch Leads

Complete with Double-Strength, Grade A, Clear Glass Covers

Line Voltage (60 Cycle)	Lamp Data		Ballasts (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price*
	Approx. Current	Approx. Watts				
110-125V.	430MA.	2-40	One twin-lamp	47 1/4	46562-CL	
220-250V.	430MA.	2-40	One twin-lamp	47 1/4	46582-CL	

Complete with Tempered Plate Clear Glass Covers

110-125V.	430MA.	2-40	One twin-lamp	49 1/4	46562-TP	
220-250V.	430MA.	2-40	One twin-lamp	49 1/4	46582-TP	

THREE-LAMP UNITS*—Wired with 6-inch Leads

Complete with Double-Strength, Grade A, Clear Glass Covers

Line Voltage (60 Cycle)	Lamp Data		Ballasts (High Power Factor)	Net Wt. Lbs. Ea.	Cat. No.	List Price*
	Approx. Current	Approx. Watts				
110-125V.	430MA.	3-40	One twin plus one single-lamp	58 1/4	46563-CL	
220-250V.	430MA.	3-40	One twin plus one single-lamp	58 1/4	46583-CL	

Complete with Tempered Plate Clear Glass Covers

110-125V.	430MA.	3-40	One twin plus one single-lamp	60 1/4	46563-TP	
220-250V.	430MA.	3-40	One twin plus one single-lamp	60 1/4	46583-TP	

COVER GLASSES FOR REPLACEMENT

Description	Cat. No.	List Price*
Double-Strength, Grade A, Clear Glass with Rubber Gasket and Metal Clips	8415	
Tempered Plate, Clear Glass with Rubber Gasket and Metal Clips	8416	

Wire Glass Covers—To order, suffix "WG" in place of "CL" on Catalog Numbers for units with Double-Strength, Grade A, Clear Glass Covers. Prices on application.

Lamps not supplied.

*For Prices see current "Fluorescent Net Price List" and Supplements

*Schedule 2-F

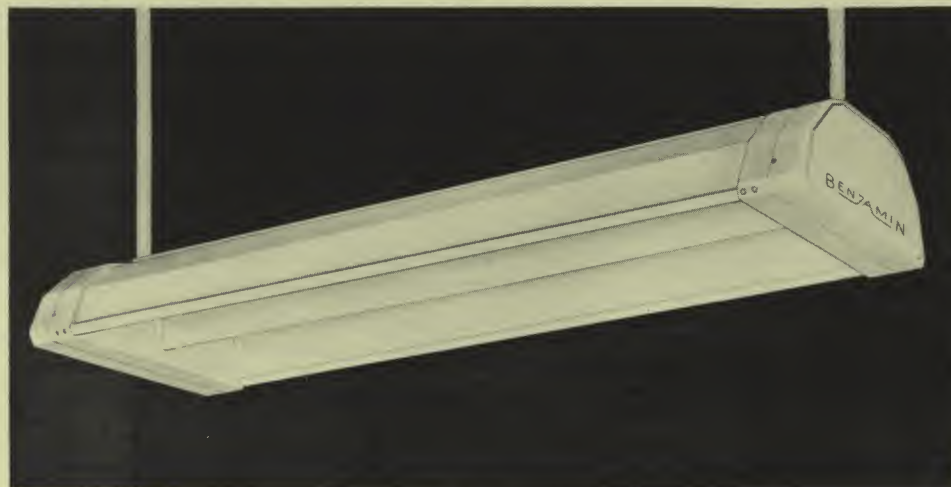
BENJAMIN**advance
catalog
information**

New "TASK-MASTER" Lighting Systems

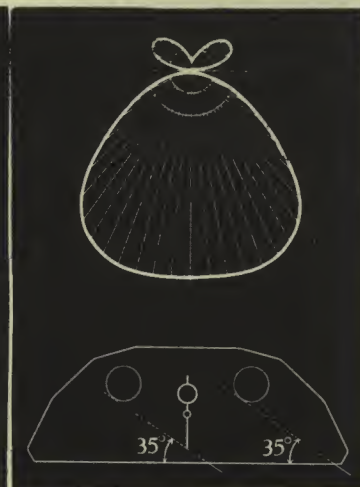
Individual Unit or Continuous Line Systems
for 96-inch and 48-inch, T12 Slimline Lamps

Approved by Underwriters' Laboratories, Inc.

No. A-6



"Task-Master 48" Individual Unit



Top — Typical "Task-Master" Distribution curve. Bottom—Cross section showing shielding angle.

- 35° lamp shielding
- 25% light directed upward
- Completely pre-wired (including branch circuit wiring in continuous line sections)
- NO wire splicing necessary (all connections made to terminal blocks)
- Porcelain Enamel reflectors and lamp shields
- Exclusive Benjamin "SPRINGLOX" lampholders
- Hinged, Detachable reflectors
- Easy Access to Ballasts

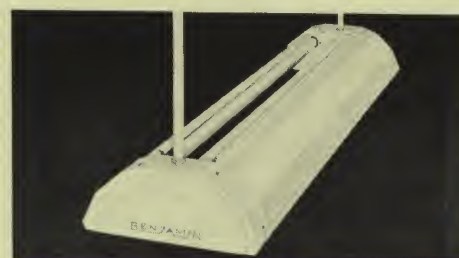
"Task-Master" systems represent the biggest advance in industrial and semi-industrial lighting in many years.

Unique new lighting and mechanical features have been engineered into "Task-Master" systems: extra-deep shielding; large percentage of light directed upward; all white in color; special installation and maintenance helps and many others.

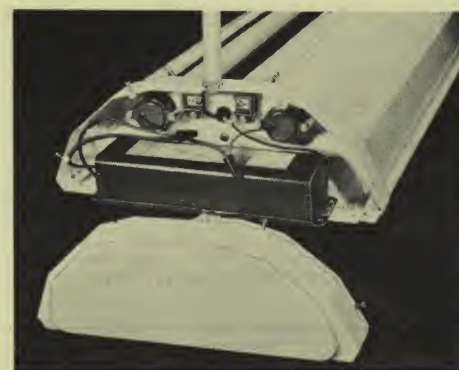
"Task-Master" lighting systems thoroughly meet today's highest standards for the lighting of high-speed and efficient industrial operations.

"Task-Master" can double or even triple seeing comfort in most industrial areas today. This means higher productive output per worker, lower accident rates, more employee satisfaction.

Whether the lighting job is a modernization program or for new construction, "Task-Master" lighting systems provide the most modern, high-performance industrial, and semi-industrial, lighting equipment available today.



Looking down at the top of a "Task-Master 48" Individual Unit.



View shows how Terminal Blocks, Ballast and Lampholders are carried in Housing at end of Unit.

(Issued June 30, 1952)

Temporary pages 374G-8 & 374G-9

New "TASK-MASTER" Lighting Systems

for 96-inch and 48-inch, T12 Slimline Lamps



"Task-Master 48" showing one reflector half in open position.

SPECIFICATIONS

Lighting Data—"Task-Master" systems give 35 degree lamp shielding and direct 25 percent of the light upward.

Basic Section—Consists of two end-housings permanently and rigidly connected by a combination wiring-spine and shield and two channels which also act as hinges for the reflector halves.

Housings and housing covers are formed of 18 gauge steel finished in baked white enamel over phosphorizing. Wiring-spine and shield are 19 gauge steel finished in white porcelain enamel (matte finish, 78% reflection factor). Reflector halves are 20 gauge steel finished in white porcelain enamel (minimum reflection factor, 82%).

End-housings contain ballasts, terminal blocks and lamp holders. Bottom of housings has a removable plate for access to ballast without removing end-housing covers.

INDIVIDUAL UNITS: Come complete with end-housing covers. Ballast is in one end and a pair of terminal blocks in the opposite end.

CONTINUOUS LINE SECTIONS: Come without end-housing covers. Have a ballast in one end and a pair of

terminal blocks in both ends. These sections also include #12 branch circuit wiring already installed and a pair of #12 wire jumpers for connections between terminal blocks of adjacent sections. A handy hold-up hook is provided in each end for temporary suspension of adjacent sections during installation.

Ballasts—Two-lamp, Sequence-Start, Series-Type for 110-125V operation.

Lampholders—Individual Benjamin "Springlox" for Slimline lamps. Space lamps on 6 $\frac{1}{8}$ -inch centers. Underwriters' approved.

Wiring—Completely prewired including branch circuit wiring in continuous line sections.

Sliding Hangers—Heavy rugged tong-type available for $\frac{1}{2}$ -inch conduit and $\frac{3}{8}$ -inch rod.

SUSPENSION

Conduit Suspension for Individual Unit or Continuous Line Systems—Each Section has a pair of $\frac{7}{8}$ -inch diameter knockouts. "Task-Master 96" has these knockouts spaced on 96 $\frac{3}{8}$ -inch centers; "Task-Master 48", on 48 $\frac{3}{8}$ -inch centers. (On continuous runs, mounting centers are on 98 $\frac{1}{4}$ " and 50 $\frac{1}{4}$ " respectively, as all, except the end section, need only one supporting stem.

Chain Suspension for Individual Units—A pair of chain hanger brackets is supplied with each Individual Unit. These brackets fit into knockouts in each end of Units. "Task-Master 96" chain bracket knockouts are spaced on 96 $\frac{3}{8}$ -inch centers; "Task-Master 48", on 48 $\frac{3}{8}$ -inch centers.

Sliding Hanger Suspension for Individual Units or Continuous Line Systems—These Hangers may be clamped at any position along the combination wiring-spine and shield. On Continuous Line Installations, order one more Sliding Hanger than the number of sections in the run.

INDIVIDUAL UNITS—Complete WITH End Covers for Individual Suspension

Voltage (60 cycle)	No. of Lamps	Ballasts*	For 96-inch T12 Slimline Lamps				For 48-inch T12 Slimline Lamps			
			Overall Dimensions			Cat. No.	Overall Dimensions			Cat. No.
			L	W	H		L	W	H	
110-125V	2	430 MA	8'7 $\frac{1}{4}$ "	16 $\frac{1}{16}$ "	5'1 $\frac{1}{16}$ "	96302	4'7 $\frac{1}{4}$ "	16 $\frac{1}{16}$ "	5'1 $\frac{1}{16}$ "	48302

SECTIONS—WITHOUT End Covers for Continuous Line Suspension

Voltage	No. of Lamps	Ballasts*	L	W	H	Cat. No.	L	W	H	Cat. No.
110-125V	2	430 MA	8'2 $\frac{1}{4}$ "	16 $\frac{1}{16}$ "	5'1 $\frac{1}{16}$ "	96402	4'2 $\frac{1}{4}$ "	16 $\frac{1}{16}$ "	5'1 $\frac{1}{16}$ "	48402

*240-280V. or 220-250V. ballasts are available upon application.

Lamps not Supplied

PARTS

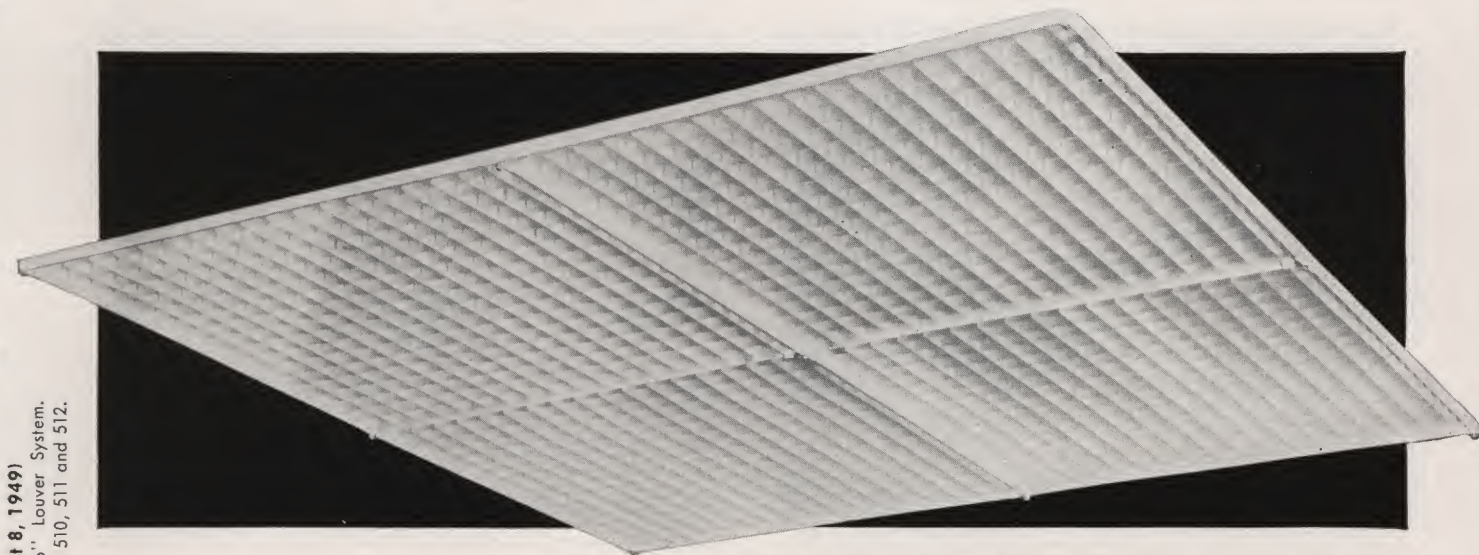
Description	Cat. No.	Description	Cat. No.
END HOUSING COVER for ALL Sections	96480	Half-Reflector for "Task-Master 96" (Replacement Only)	96484
SLIDING HANGER for $\frac{1}{2}$ -inch Conduit	96351	Half-Reflector for "Task-Master 48" (Replacement Only)	48484
SLIDING HANGER for $\frac{3}{8}$ -inch Rod	96356		

For PRICES, see current "Fluorescent Net Price List" and Supplement

BENJAMIN ELECTRIC MFG. COMPANY • Des Plaines, Illinois

Benjamin "Sky-Glo" Louver System

A Luminous Louverall Lighting System using "Vinylite" Plastic Louvers



Looking up at an illuminated section of the "Sky-Glo" louverall system. Note the diffuse, luminous quality which results from the high light transmission factor of the Vinylite louvers.

Designed for lighting: offices • schools • banks • drafting rooms • reception rooms • lobbies • stores and other commercial locations.

This Benjamin "Sky-Glo" Luminous Louver System of translucent louvers presents an entirely new concept in "Louverall" lighting. It affords an opportunity to obtain high footcandle levels of illumination without annoying glare.

This luminous louverall lighting system, distinguished for its simplicity and versatility, completely conceals from view the lighting units, as well as unsightly ducts, pipes, outlet boxes, conduit, etc., substituting at reasonable cost a clean translucent ceiling of pleasing architectural and decorative patterns.

The Benjamin "Sky-Glo" louver system provides a translucent ceiling that actually glows with light. It not only affords a means of obtaining more light without annoying glare but actually offers a new experience in seeing.

With the "Sky-Glo" system it is possible to ob-

tain high levels of illumination . . . in the range of 100 to 130 or more footcandles . . . without awareness of the fact. Seeing is so easy . . . the soft glareless illumination is kind to the eyes . . . the atmosphere provided is restful, yet stimulating.

The lighting system is unobtrusive . . . gone is a forest of individually hung light sources and in their place . . . a beautiful glowing ceiling of light.

The Benjamin "Sky-Glo" luminous louver system is a symmetrical pattern of translucent Vinylite louvers, supported below the lighting equipment by a channel system suspended from the room ceiling. The system is made up from standard stock parts to fit practically any size or shape of room, providing a modern streamlined ceiling of pleasing architectural pattern.

In cases where it may not be desired to fill in the entire ceiling area, excellent illumination and very pleasing effects may be attained by partial installation over such areas as display counters, lobbies, entrance-ways, etc. Installation has been made easy and a number of novel features simplify maintenance.

Outstanding Features

HIGH INTENSITIES — LOW BRIGHTNESS

The translucent Vinylite louvers, which form the basis of the Benjamin "Sky-Glo" system, have a light transmission factor of 71 per cent and a reflection factor of 19 per cent which makes possible uniform, diffused illumination of high intensity. These louvers do not visibly alter the color of light from any source. Crosswise and lengthwise shielding of 45 degrees eliminates glare and uncomfortable brightness. The most effective way of obtaining high levels of illumination, now made practical by the "Sky-Glo" system, is through the use of the new Benjamin "Strip-Line" System, Benjamin RLM "Twin-Flo 40" and "Triple-Flo 40" individual fluorescent units or Benjamin "Lite-Line 40" continuous fluorescent system above the louvers.

MODERN STREAMLINED CEILING

The "Sky-Glo" system can be suspended below the room ceiling at any point from 8'-6" above the floor and completely conceals fixtures, unsightly ducts, pipes, conduit, beams, etc. It is adaptable to old or new buildings alike and eliminates the necessity of expensive ceiling alterations in modernizing an interior. This system will not affect the circulation of air from air conditioning units.

NEW STYLE TYPE "V" SUPPORTING FRAMEWORK

Offered in addition to the original Type "U", this new Type

of the Benjamin "Sky-Glo" louver system

"V" channel system provides an even less conspicuous support for "Sky-Glo" louver sections. Type "V" channels are designed to blend harmoniously into the "Sky-Glo" louver pattern.

SIMPLE LAYOUT AND INSTALLATION

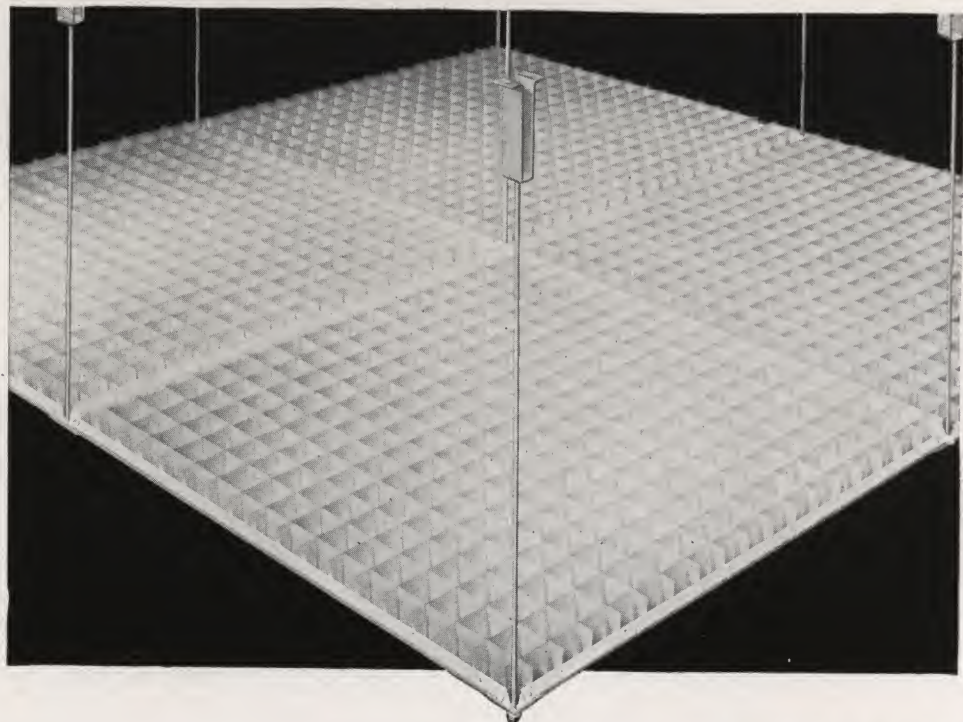
The "Sky-Glo" system may be easily installed on all common type ceilings such as, plaster, wood, concrete or tile; and in most room areas regardless of shape or size, by using the available standardized stock sections of louvers, supporting channels, couplings and fittings.

The various sizes of louver sections rest on a channel framework made of various lengths of supporting channels which are suspended from the ceiling by means of suspension rod assemblies.

It is a simple matter to lay out the ceiling plan on paper, suspend the channel network at the proper points from the ceiling and then to install the louver sections with notched sides resting on the supporting channels.

In square and rectangular rooms of any size the louver system can be brought to within at least 6-inches of the walls. By using the available adjustable fittings the system can also be fitted to irregularly shaped rooms. "Sky-Glo" louvers can be readily cut, notched or trimmed, where required, by using small tin snips. Supporting channels may be cut to size by means of a hack saw.

Looking down from above on a section of the "Sky-Glo" luminous louverall lighting system. Illustrated are: four 3' x 3' louver sections; Type "V" channels and channel couplings; and suspension rod assemblies with 3" ceiling straps.



Outstanding Features

of the Benjamin "Sky-Glo" louver system

EASY MAINTENANCE AND CLEANING

The lightweight louver sections which rest on the supporting channels may be easily removed for cleaning by simply lifting the louver section from its supporting channels and bringing it through its own channel system opening. For ease of relamping and maintenance of lighting equipment louver sections may be removed and placed upon adjacent louver sections.

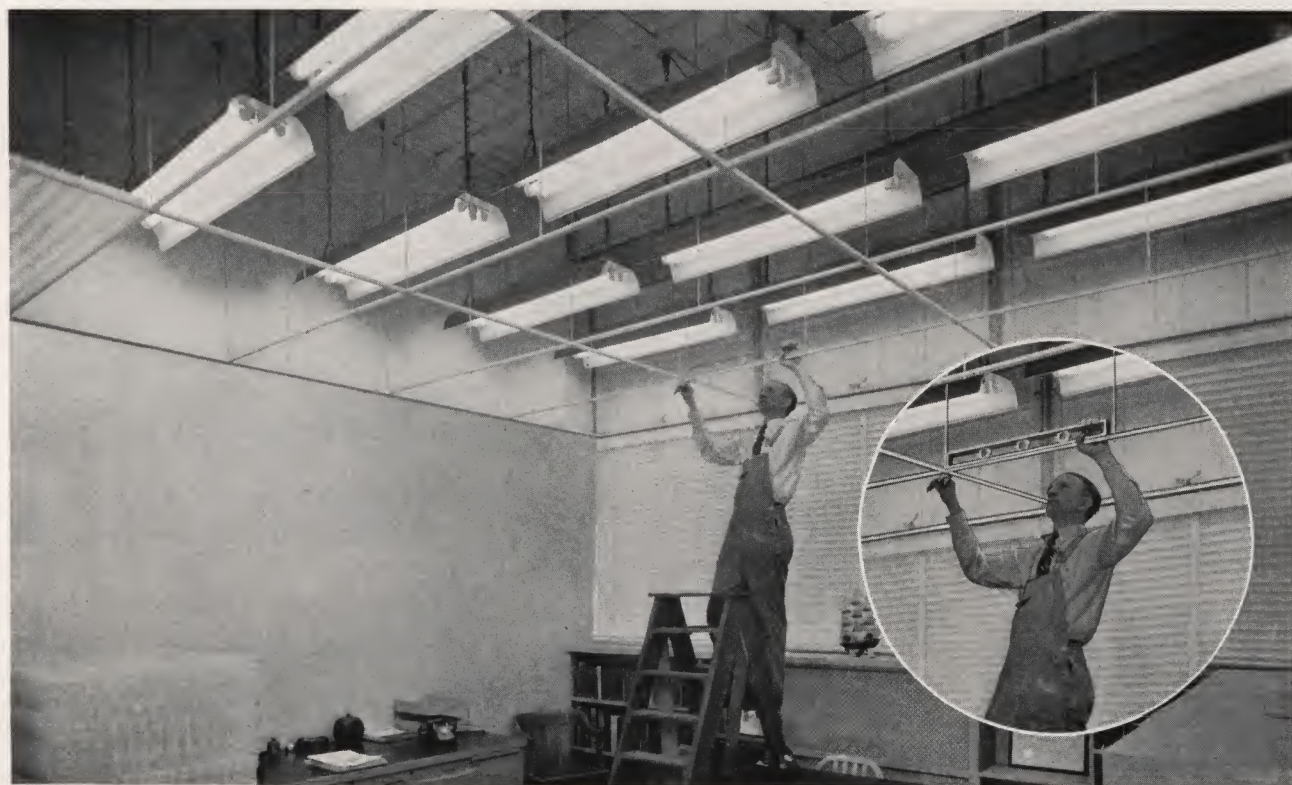
"Sky-Glo" louver material is hard and non-porous; therefore, dust does not readily adhere to its surfaces. A reasonable maintenance schedule of simply dipping louvers into a solution of lukewarm water and "Dreft", or other soapless detergent, and replacing them upon their supporting channels damp, will keep "Sky-Glo" louvers in "like new" condition.

FEATURES OF LOUVER MATERIAL

Vynlite will not discolor with age and experiences no progressive embrittlement. Louver sections of Vynlite will not shrink, warp or distort in any way due to water absorption. Vynlite is a "self-extinguishing" substance which means it will burn only when in contact with flame but will not burn after the removal of the flame.



With louver sections removed from supporting channels it is a simple matter to inspect and relamp lighting equipment.



Specifications

Louver Sections—Louver vanes for Benjamin "Sky-Glo" system louver sections are made of extruded translucent "Vinylite", a product of the Bakelite Corporation. The vanes are chemically welded to form openings in each louver section 2-inches wide, by 2-inches long, by 2-inches high, affording lengthwise and crosswise shielding angles of 45 degrees. This translucent Vinylite has a light transmission factor of 71 per cent and a reflection factor of 19 per cent, and is odorless, non-toxic and will not warp, shrink or distort in any way due to water absorption. Vinylite material is highly resistant to most common chemicals, aliphatic hydrocarbons and animal, vegetable and mineral oils, and does not support combustion. Louver vanes have a permanent mat finish which will not discolor or peel and will not alter the color of light from any source.

Louver sections are available in ten basic sizes and are notched on four sides.

Supporting Channels—Available in two different styles—Type "U" and the new Type "V"—for supporting standard louver sections.

Type "U" channels are $\frac{7}{8}$ -inch wide by $\frac{1}{2}$ -inch high and have a tapped hole at each end. Two 8-32 screws are provided for attaching to Type "U" channel couplings.

Type "V" channels are $\frac{15}{16}$ -inch wide by $\frac{5}{8}$ -inch high and have two 8-32 threaded holes at each end. Two 8-32 screws are provided for attaching to Type "V" channel couplings.

Both styles of channels come in five standard lengths and are constructed of 20 gauge steel. Type "U" channels are finished in soft white enamel over zinc chromate. Type "V" channels are finished in white enamel over zinc chromate.

Rigid Channel Couplings—Supplied in both types for connecting either Type "U" or Type "V" supporting channels and are available in three designs: "L", right angle; "T", three-way; "X", four-way.

Type "U" couplings have a $\frac{7}{32}$ -inch hole for suspension rod assembly and $\frac{3}{16}$ -inch holes for attachment to channels, using the two 8-32 screws furnished with each channel length.

Type "V" couplings have a $\frac{7}{32}$ -inch hole for suspension rod assembly and $\frac{3}{16}$ -inch wide screw slots for attachment to channels, using the two 8-32 screws furnished with each channel length.

Both types of couplings are of 20 gauge steel. Type "U" is finished in soft white enamel over zinc chromate and Type "V" in white enamel over zinc chromate.

for the Benjamin "Sky-Glo" louver system

Adjustable Channel Couplings—For Type "U" and Type "V" supporting channels. Available in "L" and "T" designs for use in laying out irregularly shaped ceiling areas.

Each coupling has a $\frac{7}{32}$ -inch hole for suspension rod assemblies and either $\frac{3}{16}$ -inch holes or screw slots for attachment to channels as described under Rigid Channel Couplings. Finish and material are the same as for rigid channel couplings.

When using these adjustable channel couplings, it is usually necessary to trim the channels to fit and drill new attaching holes.

Suspension Rod Assemblies with Ceiling Strap—For surface attachment of the "Sky-Glo" system to ceilings of wood and similar materials; and also, by using furring strips, to ceilings such as concrete, open wood joist, or pan construction.

The complete assembly consists of either a 3-inch or 5-inch ceiling strap; a continuously 10-24 threaded steel suspension rod; square lock nut and nickel plated brass cap nut.

The 3-inch ceiling strap is made of 16 gauge steel with two $\frac{13}{64}$ -inch holes spaced on $\frac{11}{8}$ -inch centers for ceiling attachment. The 5-inch strap is made of $\frac{3}{32}$ -inch steel with one centered $\frac{13}{64}$ -inch hole for ceiling attachment.

Suspension rods are available in various standard lengths and fit both Type "U" and Type "V" channel couplings. Suspension rod assemblies support the channel framework at each coupling. Unless otherwise stated, all fittings are finished in cadmium plate.

Suspension Rod Assemblies with Toggle Head—For supporting the "Sky-Glo" system from ceilings of hollow construction and such material as plaster, gypsum, lath, tile or sheet rock, suspension rod assemblies are furnished with a spring wing toggle head.

Toggle head type suspension rod assemblies consist of a $\frac{3}{16}$ -inch toggle head, a continuously 10-24 threaded steel cadmium plated suspension rod, washer, two square lock nuts, and a nickel plated brass cap nut.

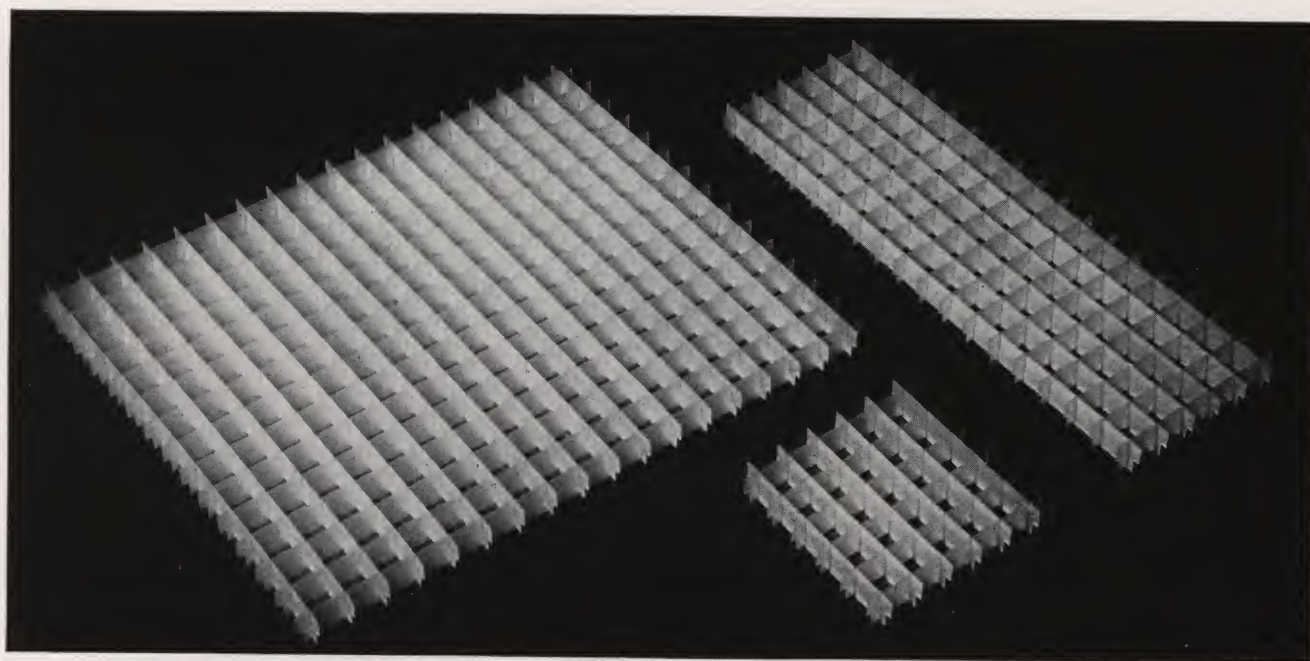
Suspension rods are available in various standard lengths.

Suspension rod assemblies support the channel framework at each coupling and accommodate both Type "U" and Type "V" couplings.

Suspension Rod Couplings—For joining together two standard length suspension rods, a suspension rod coupling is available. This coupling is hexagon in shape, 1-inch in length and is threaded all the way through. Coupling is brass and finished in cadmium plate.

Louver Sections for "Sky-Glo" System

For use with both Type "U" and Type "V" channel systems



SPECIFICATIONS

Louver vanes for Benjamin "Sky-Glo" system louver sections are made of extruded translucent "Vinylite", a product of the Bakelite Corporation. The vanes are chemically welded to form openings in each louver section 2-inches wide, by 2-inches long, by 2-inches high, affording lengthwise and crosswise shielding angles of 45 degrees. This rigid, translucent Vinylite has a light transmission factor of 71 per cent and a reflection factor of 19 per cent, and is odorless, non-toxic and will not warp, shrink or distort in any way due to water absorption.

Vinylite material is highly resistant to most common

chemicals, aliphatic hydrocarbons and animal, vegetable and mineral oils, and does not support combustion. Louver vanes have a permanent mat finish on both sides which will not discolor or peel and will not alter the color of light from any source.

This material will not support combustion and is classified as self-extinguishing. Louver sections and their supporting parts do not weigh in excess of one pound per square foot.

All standard louver sections are for use with either Type "U" or Type "V" channel systems. Where installation irregularities may require, louver section material will permit trimming and cutting, without chipping, fracturing or curling.

Size In Feet	Description	Cat. No.	List Price
3 x 4	Notched on Four Sides	40595	\$33.60
3 x 3	Notched on Four Sides	40528	25.20
2 1/2 x 3	Notched on Four Sides	40524	21.00
2 x 4	Notched on Four Sides	40594	22.40
2 x 3	Notched on Four Sides	40598	18.00
2 x 2	Notched on Four Sides	40592	11.20
1 x 4	Notched on Four Sides	40591	11.20
1 x 3	Notched on Four Sides	40534	9.00
1 x 2	Notched on Four Sides	40508	6.60
1 x 1	Notched on Four Sides	40504	3.30

Type "V" Supporting Channel System

Listings of Type "V" Fittings for "Sky-Glo" Louver Supporting Framework



TYPE "V" SUPPORTING CHANNELS



Top to Bottom — Cat. No. 40639; Cat. No. 40638; Cat. No. 40636

Channels are 15/16" wide by 5/8" high. All channels have two 8-32 threaded holes at each end and include two 8-32 screws for attaching channel couplings.

Supporting channels are formed of 20 gauge steel and finished in durable, baked white enamel.

Description	Cat. No.	List Price	Consisting Parts Numbers	
			Channel	Screw (Two Supplied)
48" Channel	40639	\$1.10	40535	40568
36" Channel	40638	.80	40536	40568
30" Channel	40637	.70	40537	40568
24" Channel	40636	.60	40538	40568
12" Channel	40635	.40	40539	40568

TYPE "V" RIGID CHANNEL COUPLINGS

These rigid type couplings, for joining the channel lengths, are available in "Type X" four way, "Type L" right angle, and "Type T" three way. Each coupling is provided with a 7/32" hole to accommodate a suspension rod assembly and 3/16-inch wide screw slots for attachment to channels. Couplings are attached to the channels using the two 8-32 screws supplied as consisting parts with each supporting channel length. Couplings are formed of 20 gauge steel. Finish is durable, baked white enamel.



Cat. No. 40517

Cat. No. 40518

Cat. No. 40519

Description	Cat. No.	List Price
"L" Channel Coupling (Rigid Type)	40517	\$0.40
"T" Channel Coupling (Rigid Type)	40518	.40
"X" Channel Coupling (Rigid Type)	40519	.40



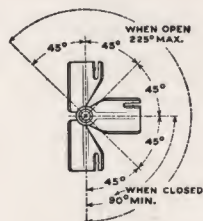
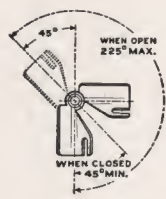
Cat. No. 40520

Cat. No. 40521

TYPE "V" ADJUSTABLE CHANNEL COUPLING

The adjustable "L" and "T" couplings listed below are for use in laying out irregular shaped ceiling areas.

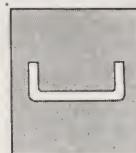
Couplings are made of 20 gauge steel. Each coupling has a 7/32-inch hole to accommodate a suspension rod and is provided with 3/16-inch wide screw slots for attachment to supporting channels. Finish is durable, baked white enamel.



Description	Cat. No.	List Price
"L" Channel Coupling (Adjustable Type)	40520	\$0.60
"T" Channel Coupling (Adjustable Type)	40521	.60

Type "U" Supporting Channel System

Listings of Type "U" Fittings for "Sky-Glo" Louver Supporting Framework



TYPE "U" SUPPORTING CHANNELS



Top to Bottom—Cat. No. 40558, Cat. No. 40551, Cat. No. 40550

Channels are $\frac{7}{8}$ " wide by $\frac{1}{2}$ " high. All channels have an 8-32 threaded hole at each end and include two 8-32 screws for attaching channel couplings.

Supporting channels are formed of 20 gauge steel and finished in durable, baked soft white enamel.

Description	Cat. No.	List Price	Consisting Parts Numbers	
			Channel	Screw (two supplied)
48" Channel	40558	\$1.10	40548	40589
36" Channel	40551	.80	40541	40589
30" Channel	40556	.70	40546	40589
24" Channel	40554	.60	40544	40589
12" Channel	40550	.40	40540	40589



Cat. No. 40560

Cat. No. 40561

Cat. No. 40562

TYPE "U" RIGID CHANNEL COUPLINGS

These rigid type couplings, for joining the channel lengths, are available in "type X" four way, "type L" right angle, and "type T" three way. Couplings are formed of 20 gauge steel and are provided with a $\frac{7}{32}$ " hole to accommodate a suspension rod assembly and $\frac{3}{16}$ -inch holes for attachment to channels. Couplings are screwed to the channels using the two 8-32 screws supplied as consisting parts with each supporting channel length. Finish is durable, baked soft white enamel.



Cat. No. 40563

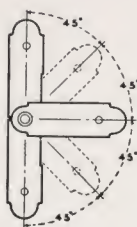
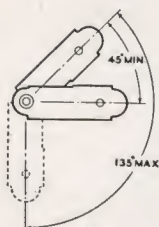
Cat. No. 40564

Description	Cat. No.	List Price
"L" Channel Coupling (Rigid Type)	40560	\$ 0.40
"T" Channel Coupling (Rigid Type)	40561	.40
"X" Channel Coupling (Rigid Type)	40562	.40

TYPE "U" ADJUSTABLE CHANNEL COUPLINGS

The adjustable "L" and "T" couplings listed below are for use in laying out irregular shaped ceiling areas.

Couplings are formed of 20 gauge steel. Each coupling has a $\frac{7}{32}$ -inch hole to accommodate a suspension rod and is provided with $\frac{3}{16}$ -inch holes for attachment to supporting channels. Finish is durable, baked soft white enamel.



Description	Cat. No.	List Price
"L" Channel Coupling (Adjustable Type)	40563	\$ 0.60
"T" Channel Coupling (Adjustable Type)	40564	.60

Suspension Rod Assemblies

For use with Type "V" and Type "U" Supporting Channels

Complete Suspension Rod Assemblies for suspending the channel framework from the ceiling consist of a rod, cap nut, lock nut and ceiling strap or spring wing toggle head.

Rod—Continuously threaded, 3/16-inch steel rod. Supplied in various standard lengths.

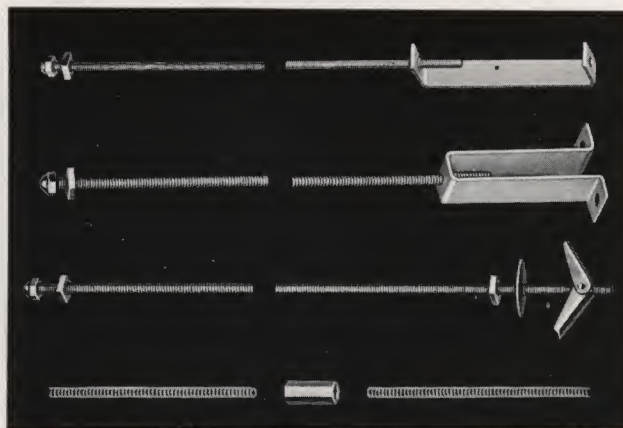
Nuts—10-24 cap nut is nickel plated. Lock nut is square.

Ceiling Straps—Available in two sizes, 3-inch and 5-inch. The 3-inch strap has two 13/64-inch holes spaced on 1 1/8-inch centers for ceiling attachment. The 5-inch strap has one 13/64-inch centered hole for ceiling attachment.

Spring Wing Toggle Head—Requires a 9/16-inch hole for ceiling insertion.

Rod Coupling—Where extra long suspension rods are necessary, a brass coupling is available for joining to standard length rods.

Finish—Unless otherwise specified, all fittings are finished in cadmium plate.



Top to Bottom—Cat. No. 40516, with 5-inch Ceiling Strap; Cat. No. 40583, with 3-inch Ceiling Strap; Cat. No. 40600, with Spring Wing Toggle Head; Cat. No. 40587, suspension rod coupling.

COMPLETE SUSPENSION ROD ASSEMBLIES

Complete with 3-inch Ceiling Strap*

Description	Cat. No.	List Price	Consisting Parts			
			Assembly less Rod		Rod Only	
			Cat. No.	List Price	Cat. No.	List Price
27" Rod Assembly with 3" Ceiling Strap	40580	\$0.70	40579	\$0.30	40570	\$0.40
36" Rod Assembly with 3" Ceiling Strap	40581	.80	40579	.30	40571	.50
48" Rod Assembly with 3" Ceiling Strap	40582	.90	40579	.30	40572	.60
60" Rod Assembly with 3" Ceiling Strap	40583	1.00	40579	.30	40573	.70

Complete with 5-inch Ceiling Strap*

27" Rod Assembly with 5" Ceiling Strap	40510	\$0.70	40516	\$0.30	40570	\$0.40
30" Rod Assembly with 5" Ceiling Strap	40511	.70	40516	.30	40574	.40
36" Rod Assembly with 5" Ceiling Strap	40512	.80	40516	.30	40571	.50
48" Rod Assembly with 5" Ceiling Strap	40514	.90	40516	.30	40572	.60
60" Rod Assembly with 5" Ceiling Strap	40515	1.00	40516	.30	40573	.70

Complete with Spring Wing Toggle Head**

30" Rod Assembly with Toggle Head	40600	\$0.80	40567	\$0.40	40574	\$0.40
36" Rod Assembly with Toggle Head	40601	.90	40567	.40	40571	.50
48" Rod Assembly with Toggle Head	40602	1.00	40567	.40	40572	.60
60" Rod Assembly with Toggle Head	40603	1.10	40567	.40	40573	.70

SUSPENSION ROD COUPLING

Description	Cat. No.	List Price
Brass, Rod Coupling (1-inch in length; threaded through)	40587	\$0.20

*Consists of rod, strap, lock nut and cap nut.

**Consists of rod, toggle head, two lock nuts, washer and cap nut.

bulletin
gl

"Grid-Lite" • a new
overall ceiling lighting system

*Reprinted from Section 14, Benjamin General Catalog

BENJAMIN

More than a half century's experience producing Lighting Equipment

**Benjamin Laboratory Works
Continuously Toward Better Lighting Equipment
and More Accurate Lighting Information**

The Benjamin Laboratory was built to fill a very definite need. This need came about because lighting equipment has become more complex from electrical, mechanical and lighting standpoints. The Benjamin Laboratory has provided the improved facilities required to adequately develop and test complex lighting equipment for modern day needs.



**Photometric Laboratory
Gets Accurate Illumination Data on
Benjamin Lighting Equipment**

Practically all types of lighting equipment can be analyzed for lighting data here. Typical data includes precise light distributions, light output efficiencies and iso-lux curves. Equipment includes several integrating spheres one of which is 12.5 feet in diameter; photometers; brightness meters and reflectometers.



**Laboratory Model Shop is
Important Link in Product Development**

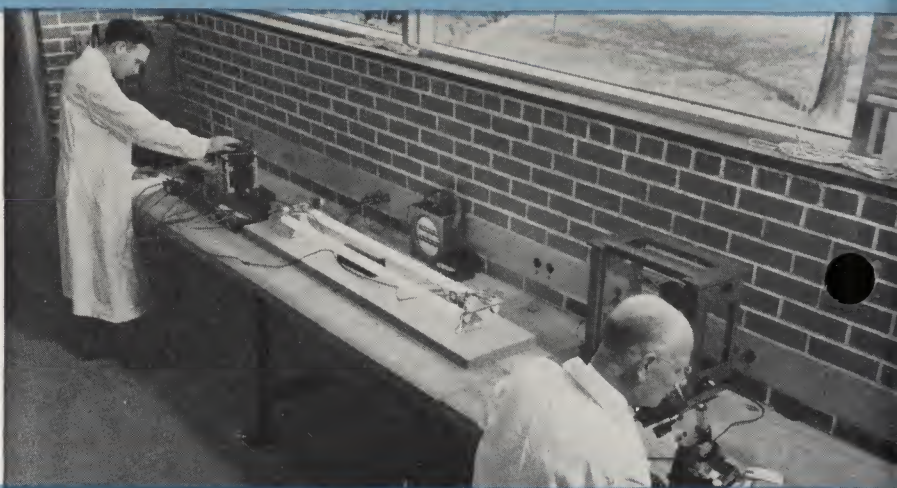
Highly trained model-makers in a complete, modern shop build test-models of new products. These models figure prominently in ironing out design and operation "bugs" so that new Benjamin products go on the market "ready for use."



**Physical and Electrical Test Lab Helps Develop
New Equipment and Keeps Tab on
Quality of Production Line**

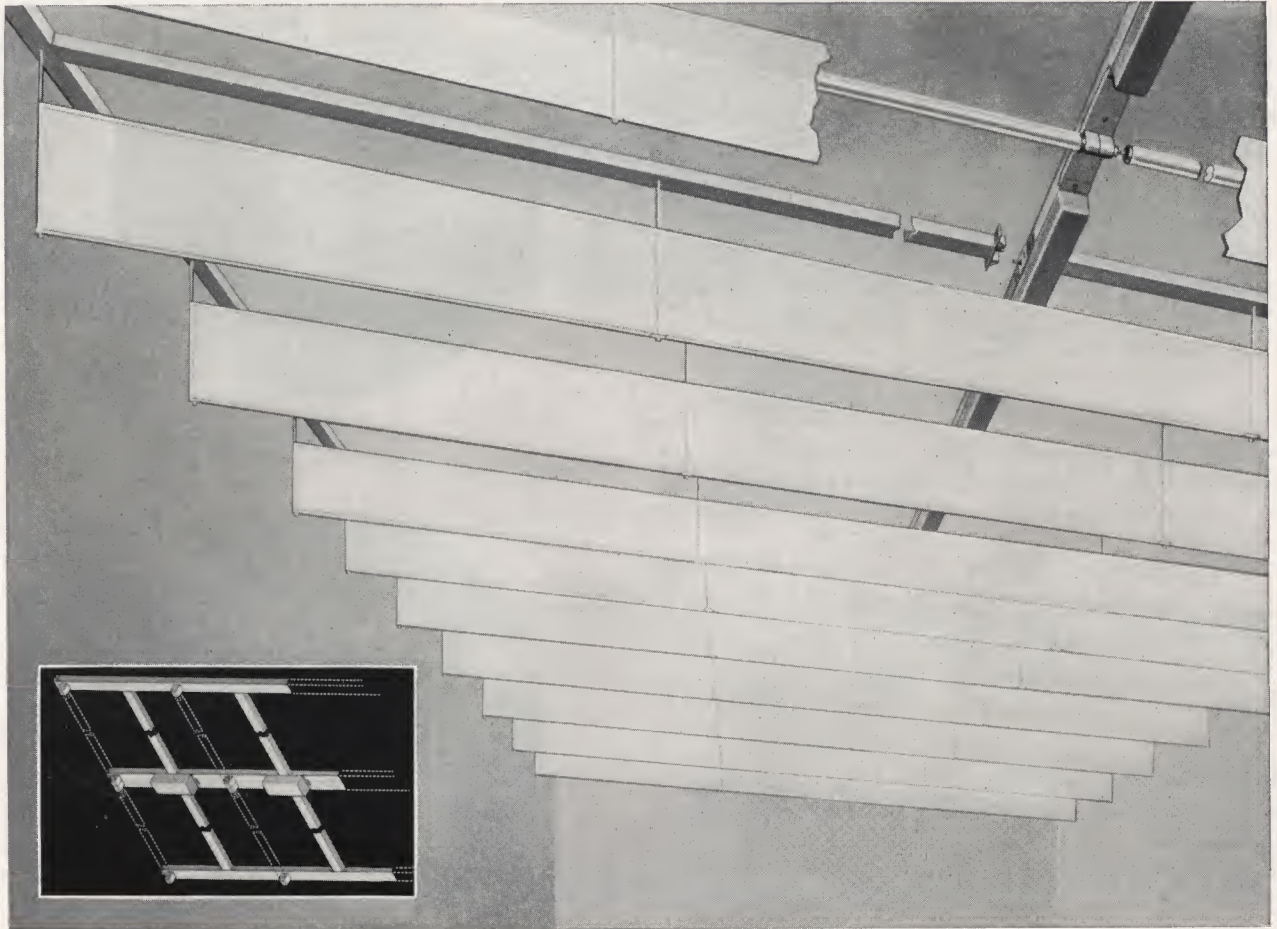
Facilities in this section of the Benjamin Laboratory are used primarily to test resistance of lighting equipment to corrosion, weathering, vibration and to check electrical characteristics of lamps, ballasts, etc.

Users of Benjamin equipment benefit directly by getting longer life and higher efficiency from their lighting systems.



New Benjamin "GRID-LITE" Lighting System

for 96-inch, 72-inch or 48-inch T12 Slimline Lamps



for:

- classrooms
- stores
- offices
- drafting rooms

An entire ceiling of light at moderate cost . . . high efficiency with minimum maintenance . . . easy ordering and simple installation . . . these advantages have at last been engineered into one lighting system—Benjamin "GRID-LITE."

The "GRID-LITE" system consists of a grid or network of steel channels spread over the entire ceiling. These channels carry the necessary wiring, and support TRANSLUCENT DIFFUSER SHIELDS and efficient slimline lamps. This combination is designed to provide today's recommended foot-candle levels in a truly comfortable and unobtrusive manner.

Students, customers, employees find that "seeing" under "GRID-LITE" is not a chore. This results, naturally, in increased efficiency and satisfaction.

But "GRID-LITE" is not only an efficient light-producing system. It is also a real "appearance-asset" in today's clean, modern interiors.

For modernization programs or for new construction, "GRID-LITE" is a system to consider for a multitude of lighting applications.

Features

of Benjamin "GRID-LITE" Systems

FEATURES

Prewired—The only wiring to be done on the job is connecting the line wires to various points of the lighting system.

Designed for Easy Installation—All channel sections are designed to plug into each other, end-to-end, no couplings needed. In addition, plugging in the spacer channel sections completes certain electrical circuits and automatically gives correct spacing of lampholders.

Little Maintenance Needed—Since a "GRID-LITE" system has practically no horizontal surface area to collect dust, very little cleaning is required. An occasional wiping of lamps plus cleaning the easily-removed plastic shield sections is all that is necessary.

High Lighting Efficiency with Good Distribution—The Translucent shields promote better light diffusion and higher light output. Because lamps are distributed over most of the ceiling, the lighting is shadowless and of high quality.

Easy to Specify and Order—"GRID-LITE" can be ordered in a variety of large, sub-assembly, "Unit-Package" sections. Combinations of these sections can be easily laid out to fit rooms of practically all sizes and shapes.

For rooms of approximately 16' 4" x 26' and somewhat larger, a complete, room-size "GRID-LITE" system can be ordered under one Catalog Number. This lighting system is 16' x 24' and gives pre-determined ranges of footcandle levels plus eliminating the need for scaling, calculating, etc.

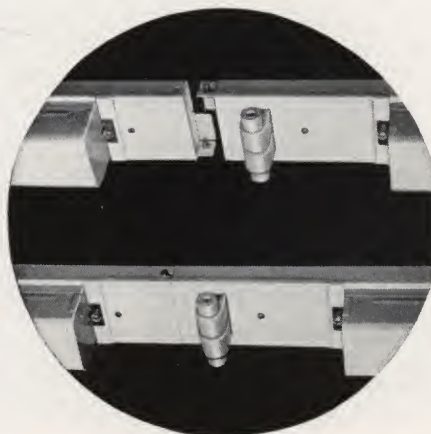
Choice of Lamps, Sizes—"GRID-LITE" systems are available as a room-size system and in either two- or four-lamp "Unit Package" sections. In addition, each of these sections is available for 96-inch, 72-inch or 48-inch, T12 Slimline Lamps. This variety of sizes and lamps allows the application of "GRID-LITE" systems to practically any size room.

Choice of Ballasts—"GRID-LITE" systems are available with 425 MA ballasts or with 200 MA ballasts which give a lower footcandle level and lamp brightness.

Can Be Used With Louver Ceilings—"GRID-LITE" systems without Shields are an excellent light source for luminous ceilings and other architectural elements.



Plug-in type Spacer Channels complete circuits and give accurate spacing of lampholders.



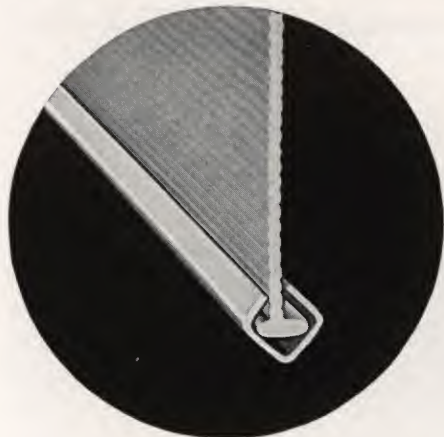
Benjamin "Intra-Lok" design quickly locks Channel sections end-to-end, no couplings needed.



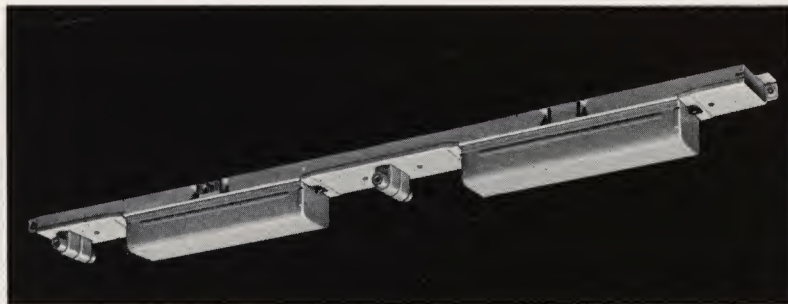
Wire Spring Clip makes plastic Shield Sections easy to remove and install.

Specifications and Installation

for Benjamin "GRID-LITE" Systems



Cross Section of Diffuser Shield showing ribbed plastic and metal frame.



Ballast Channel Section showing ballast and lampholder arrangements. Indentations in near side of channel are for plugging-in of dummy Spacer Channel on left and wired Spacer Channel on right.

SPECIFICATIONS

Channels—All three types of channel sections (ballast channel, spacer channel, outer channel) and channel covers are formed of 20 gauge steel finished in baked white enamel over Phosphorizing (Phosphorizing is a pre-paint treatment for steel that assures an excellent, corrosion-resisting finish).

Ballast Channel Sections and Outer Channel Sections lock end-to-end—no couplings needed—by means of Benjamin "Intra-Lok" design. Spacer Channel Sections are either "dummies" for spacing only or are wired. "Dummies" have mechanical plug-in ends only but wired sections have both mechanical and electrical plug-in ends. Spacer Channels lock Ballast Channels to Outer Channels in perfect alignment.

Outer Channel Sections have three special knockouts in each side for bringing in line wires through the Flexible Conduit Connector.

End Caps—Formed of 20 gauge steel finished in baked white enamel over phosphorizing. Used to close the open ends of channel sections at end of runs. Available in two sizes: One for Ballast Channels and one for Outer Channels. End Caps lock to channels by means of Benjamin "Intra-Lok" design.

Diffuser Shields—Translucent, ribbed polystyrene. Edges are reinforced with metal frames. Metal rods support shields from Outer and Spacer Channels. Shields provide 45 degree crosswise lamp shielding.

Flexible Conduit Connector Assembly—Used to bring line wires from outlet box to knockouts in the side of any Outer Channel Section. This assembly consists of 36 inches of special 1/2-inch flexible conduit with a channel entrance fitting at one end and a 90-degree fitting with outlet box

cover plate at the other end. This cover plate fits standard 4-inch octagonal outlet boxes.

Ballasts—High power factor, two-lamp brick-type, for instant start 96-inch, 72-inch and 48-inch T12 Slimline Lamps. Available for 425 MA (Sequence-Start Series) or 200 MA (Lead-Lag), 110-125V operation. Ballasts come mounted on the underside of each Ballast Channel Section.

Wiring—Completely pre-wired at factory.

Lampholders—Telescopic, spring-type.

Lamp and Shield Spacing—Both lamps and shields are spaced on two-foot centers.

INSTALLATION

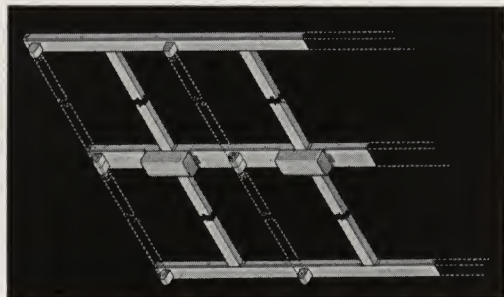
"GRID-LITE" systems are designed for surface mounting against flat ceiling areas of any common material such as: plaster, wood, concrete, etc. Installation is designed to be quick and simple.

Ballast Channel run is installed first. Outer Channel Sections are then mounted loosely, one at a time, in slight off-to-one-side position (these channels have transverse mounting "slots"). Spacer Channels then "plug" into, and between, ballast and outer channel sections. This automatically spaces and aligns entire channel system and completes all electrical circuits except line wire connections.

After line wires are connected, end caps and covers are installed on channel sections where needed. Suspension rods for supporting the shields are then screwed through Outer and Spacer Channel covers into tapped studs. Shield sections with metal frames are added which completes the installation except for installing of lamps.

Four-Lamp "Unit-Package" Sections

for Assembling Complete "GRID-LITE" Systems



FOUR-LAMP "UNIT PACKAGE" SECTIONS

For 96-inch, T12 Slimline Lamps—Without End Caps or Shields

Voltage (60 cycles)	Description	Nominal Length	Cat. No.
110-125V.	With 425 MA ballasts	4' x 16'	52104
110-125V.	With 200 MA ballasts	4' x 16'	52114

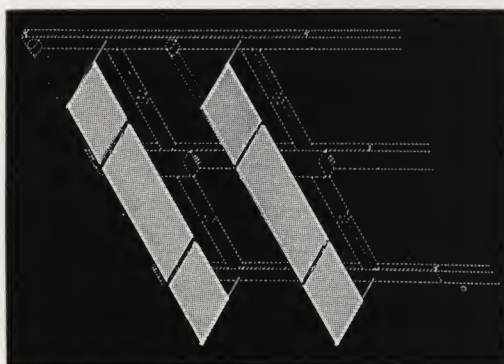
For 72-inch, T12 Slimline Lamps—Without End Caps or Shields

110-125V.	With 425 MA ballasts	4' x 12'	52204
110-125V.	With 200 MA ballasts	4' x 12'	52214

For 48-inch, T12 Slimline Lamps—Without End Caps or Shields

110-125V.	With 425 MA ballasts	4' x 8'	52304
110-125V.	With 200 MA ballasts	4' x 8'	52314

Lamps not supplied.



TRANSLUCENT PLASTIC SHIELDS—Complete with Hangers

For FOUR-LAMP Sections

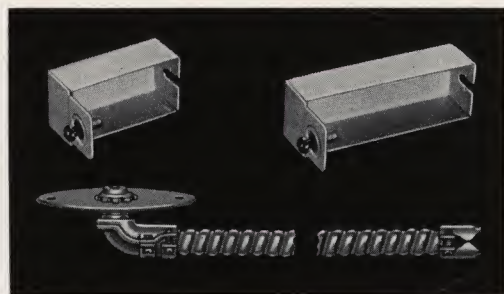
Nominal Length	How to Order	Cat. No.
16 feet	Order two* for each 96-inch, T12 lamp "Unit Package" Section	52410
12 feet	Order two* for each 72-inch, T12 lamp "Unit Package" Section	52412
8 feet	Order two* for each 48-inch, T12 lamp "Unit Package" Section	52414

Connector Type Shields for FOUR-LAMP Units

These shields are slightly longer than those listed above and are designed to permit side-by-side installation of four-lamp sections with other four-lamp sections or with two-lamp sections. This provides a continuous run of plastic shield across the combined sections.

Nominal Length	How to Order	Cat. No.
16 feet	Order two* for each 96-inch, T12 lamp "Unit Package" Section	52450
12 feet	Order two* for each 72-inch, T12 lamp "Unit Package" Section	52452
8 feet	Order two* for each 48-inch, T12 lamp "Unit Package" Section	52454

*In systems where end row of lamps is fairly close to walls of rooms, end-lamp shielding may not be necessary.

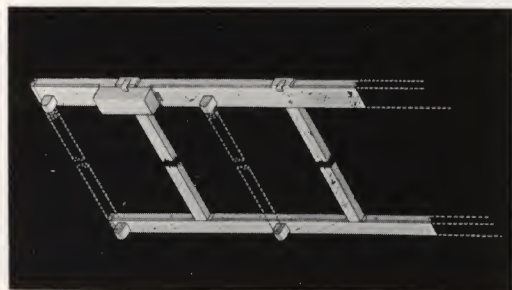


FITTINGS

Description	How to Order	Cat. No.
End Cap for BALLAST Channel Section	Order 2 for each run of Ballast Channel Sections	52401
End Cap for OUTER Channel Section	Order 2 for each run of Outer Channel Sections	52402
36-inch Flexible Conduit Connector Assembly. (Includes Conduit, 2 fittings and outlet box cover plate)	Order 1 for each Outer Channel run on average installations	52405

Two-Lamp "Unit-Package" Sections

Supplementing Four-Lamp "GRID-LITE" Sections on Preceding Page



TWO-LAMP "UNIT PACKAGE" SECTIONS

For 96-inch, T12 Slimline Lamps—Without End Caps or Shields

Voltage (60 cycles)	Description	Nominal Size	Cat. No.
110-125V.	With 425 MA ballasts	4' x 8'	52102
110-125V.	With 200 MA ballasts	4' x 8'	52112

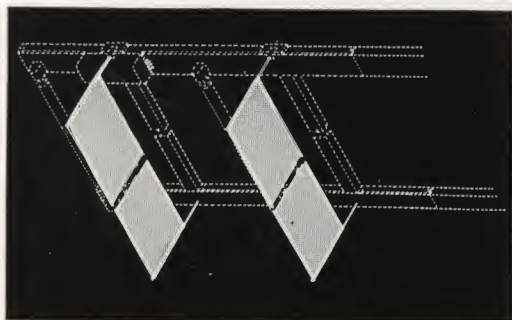
For 72-inch, T12 Slimline Lamps—Without End Caps or Shields

110-125V.	With 425 MA ballasts	4' x 6'	52202
110-125V.	With 200 MA ballasts	4' x 6'	52212

For 48-inch, T12 Slimline Lamps—Without End Caps or Shields

110-125V.	With 425 MA ballasts	4' x 4'	52302
110-125V.	With 200 MA ballasts	4' x 4'	52312

Lamps not supplied.

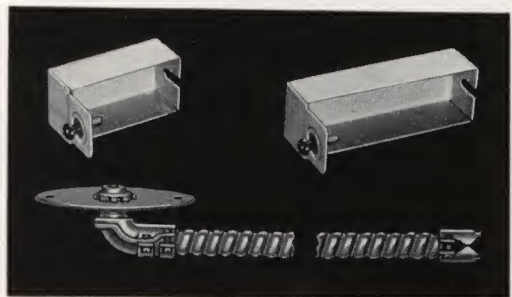


TRANSLUCENT PLASTIC SHIELDS—Complete with Hangers

For TWO-LAMP Sections

Nominal Length	How to Order	Cat. No.
8 feet	Order two* for each 96-inch, T12 lamp "Unit Package" Section	52420
6 feet	Order two* for each 72-inch, T12 lamp "Unit Package" Section	52422
4 feet	Order two* for each 48-inch, T12 lamp "Unit Package" Section	52424

*In systems where end row of lamps is fairly close to walls of rooms, end-lamp shielding may not be necessary.



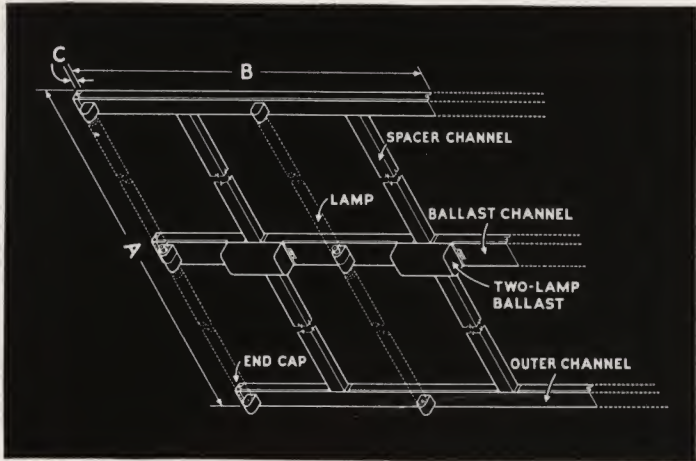
FITTINGS

Description	How to Order	Cat. No.
End Cap for BALLAST Channel Section	Order 2 for each run of Ballast Channel Sections	52401
End Cap for OUTER Channel Section	Order 2 for each run of Outer Channel Sections	52402
36-inch Flexible Conduit Connector Assembly. (Includes Conduit, 2 fittings and outlet box cover plate)	Order 1 for each Outer Channel run on average installations.	52405

Dimensional Data

for "GRID-LITE" "Unit Package" Sections

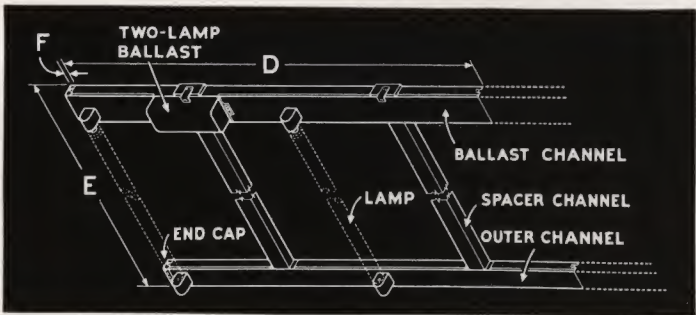
OVERALL DIMENSIONS



For FOUR-LAMP Sections*

Lamp Length	A	B	C
96-inch	16' 0 $\frac{3}{8}$ "	4' 0"	1 $\frac{3}{16}$ "
72-inch	12' 0 $\frac{3}{8}$ "	4' 0"	1 $\frac{3}{16}$ "
48-inch	8' 0 $\frac{3}{8}$ "	4' 0"	1 $\frac{3}{16}$ "

*Overall height with Shields is 15 $\frac{1}{4}$ inches.

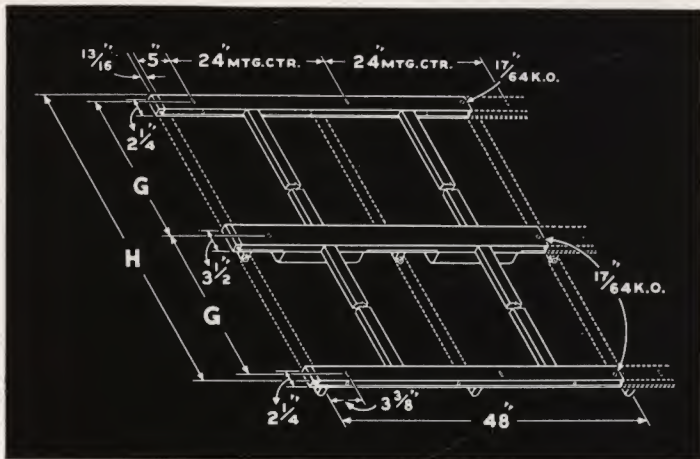


For TWO-LAMP Sections*

Lamp Length	E	D	F
96-inch	8' 2 $\frac{1}{2}$ "	4' 0"	1 $\frac{3}{16}$ "
72-inch	6' 2 $\frac{1}{2}$ "	4' 0"	1 $\frac{3}{16}$ "
48-inch	4' 2 $\frac{1}{2}$ "	4' 0"	1 $\frac{3}{16}$ "

*Overall height with Shields is 15 $\frac{1}{4}$ inches.

MOUNTING CENTERS AND DIMENSIONS



Numerical dimensions on drawing are same for all sizes of Sections.

For FOUR-LAMP Sections

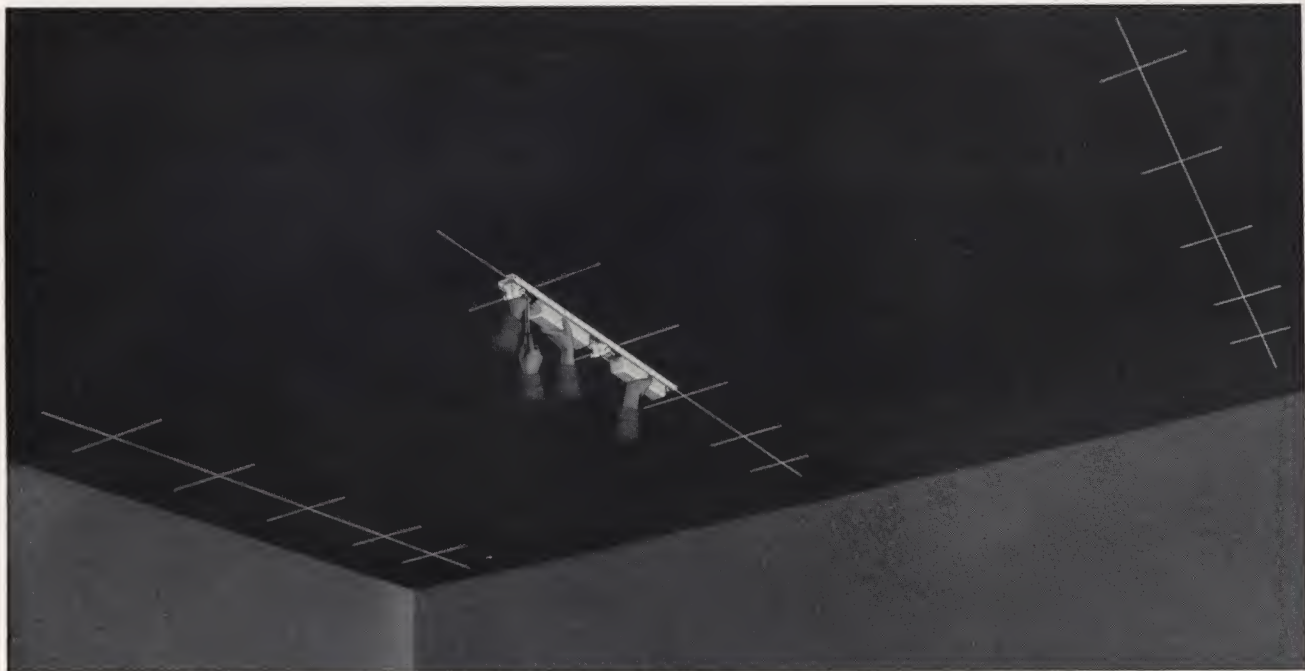
Lamp Length	H	G
96-inch	16' 0 $\frac{3}{8}$ "	7' 11 $\frac{1}{2}$ "
72-inch	12' 0 $\frac{3}{8}$ "	5' 11 $\frac{1}{2}$ "
48-inch	8' 0 $\frac{3}{8}$ "	3' 11 $\frac{1}{2}$ "

For TWO-LAMP Sections

Not illustrated but same as drawing at left less one Outer Channel and two Spacer Channels.

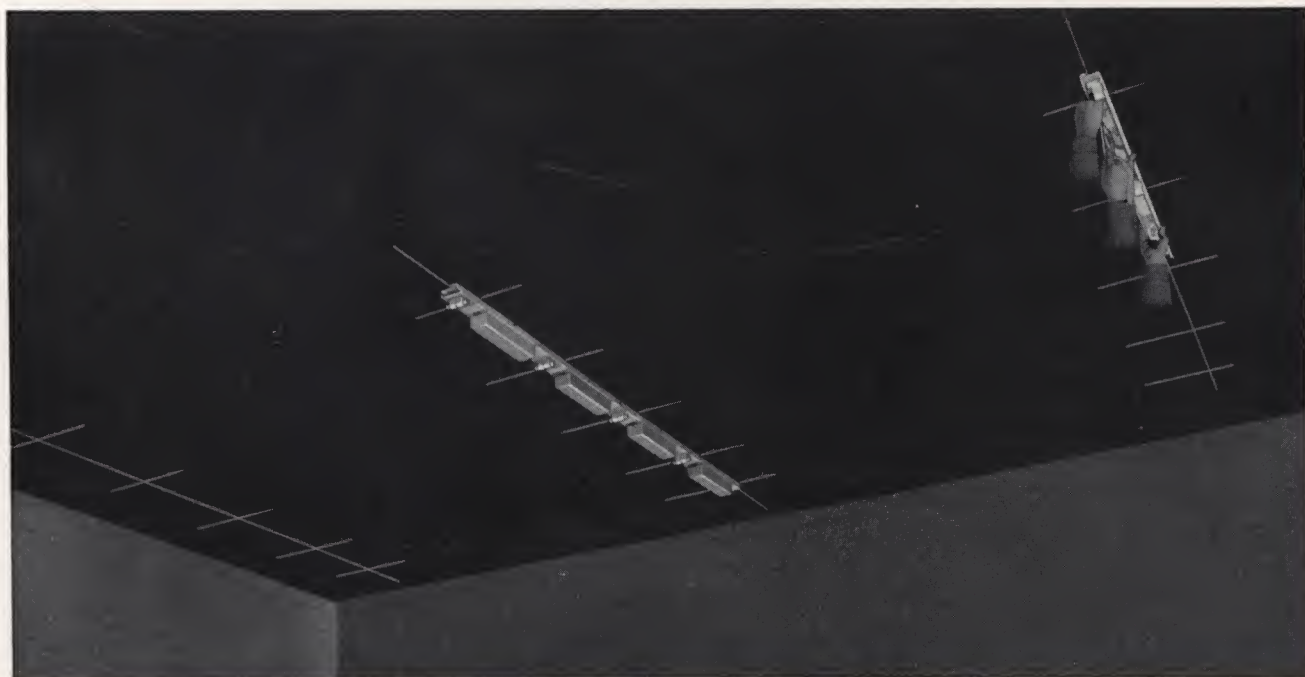
Lamp Length	G
96-inch	7' 11 $\frac{1}{2}$ "
72-inch	5' 11 $\frac{1}{2}$ "
48-inch	3' 11 $\frac{1}{2}$ "

Installation of "GRID-LITE"



1

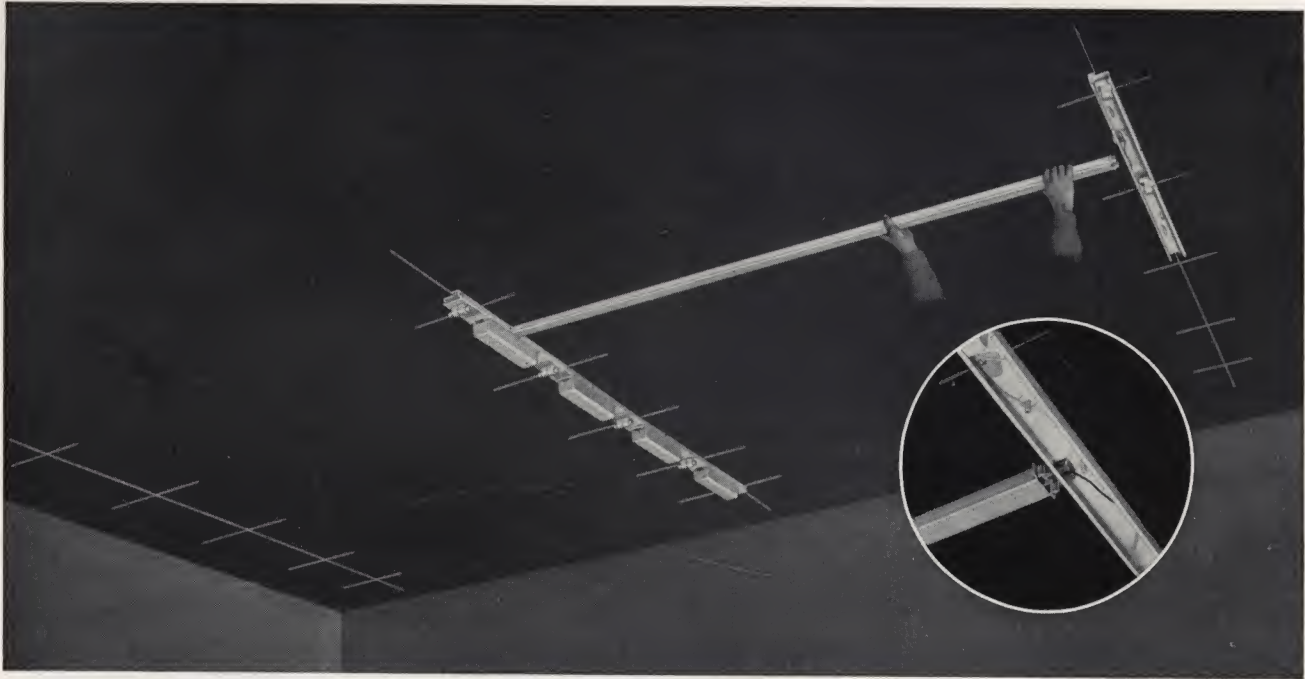
Chalk lines on ceiling indicate mounting centers of various channel runs. First section of Ballast Channel run is being installed.



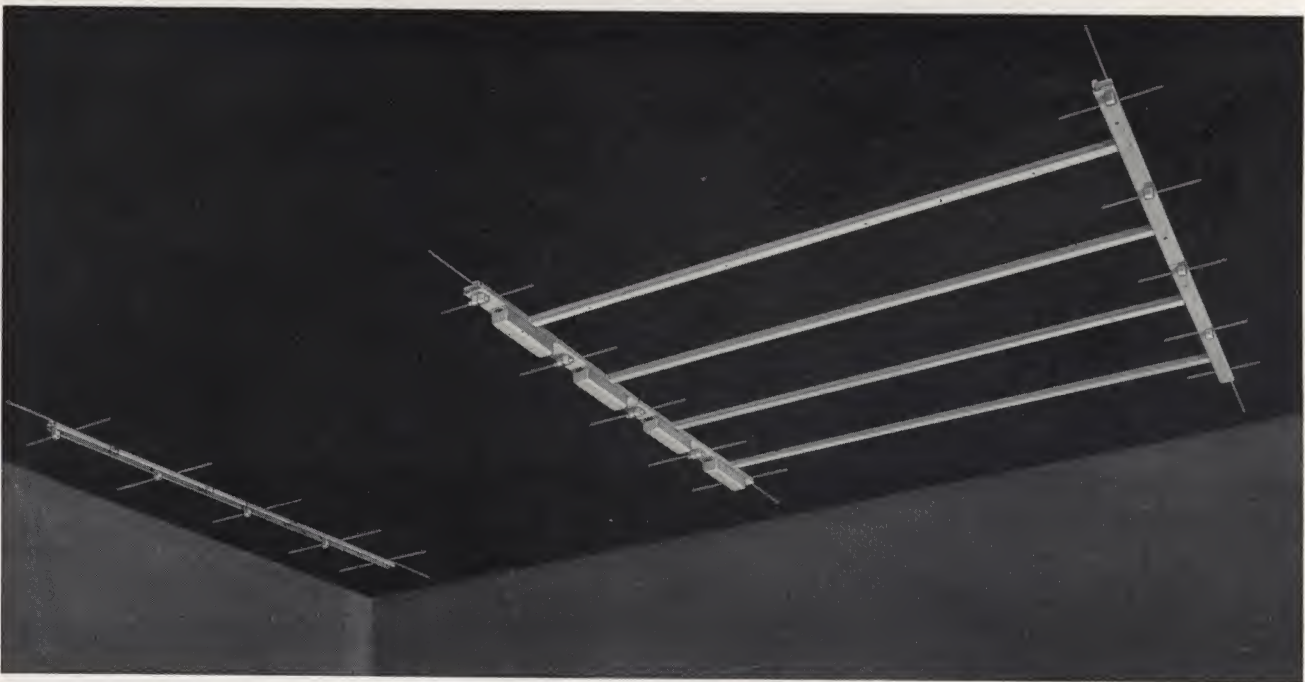
2

Ballast Channel run is completed (only two sections are shown here for purposes of illustration) and first section of an Outer Channel run is installed.

Installation of "GRID-LITE"

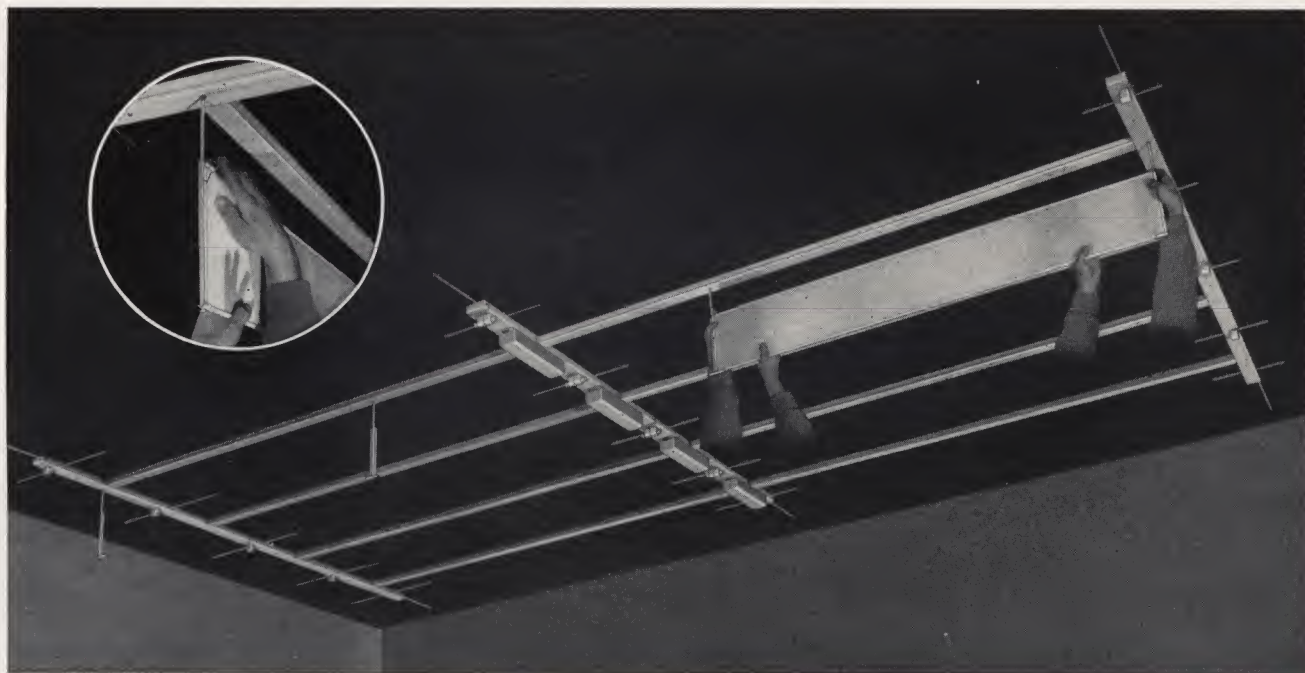


- 3** Spacer Channel is plugged-in. This channel completes certain electrical circuits and spaces the other channels for lamps.



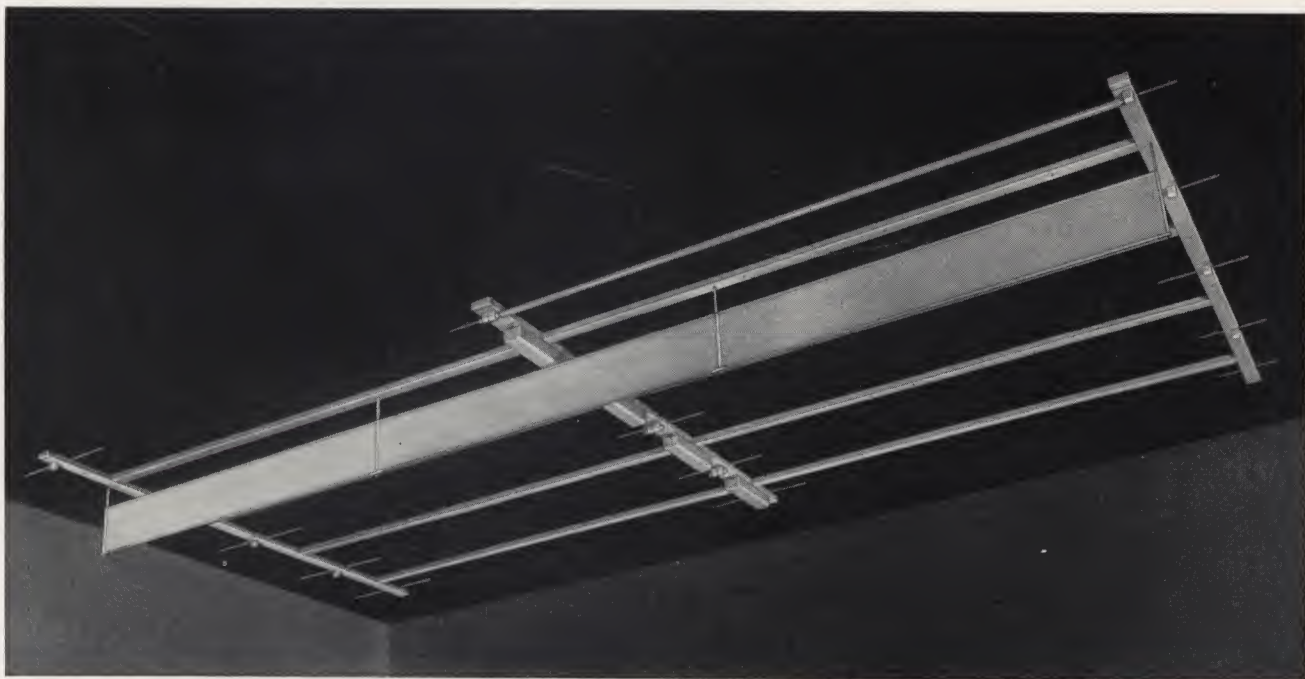
- 4** Run of outer channels on the left is ready for installation of spacer channels.

Installation of "GRID-LITE"



5

Channel installation is complete. Channel covers and end caps have been installed. Shield supports are in place and a section of the first plastic shield is being installed.



6

First plastic shield is installed. This "GRID-LITE" system of two four-lamp "Unit Package" Sections requires three more shields for completion. View also shows one lamp in place.

Typical "GRID-LITE" Layouts

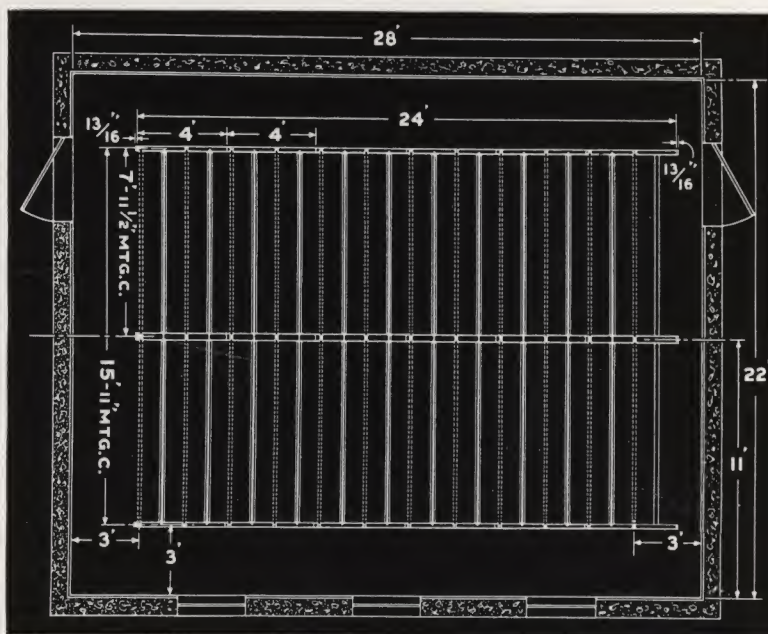
The illustrations below show two of the more simple types of layouts. The upper layout can be ordered as a COMPLETE lighting system under ONE NUMBER.

The lower layout consists of six four-lamp "Unit Package"

sections for 96-inch lamps plus six two-lamp "Unit Package" sections for 72-inch lamps. This is a side-by-side type of layout and uses the "connector type" shields to provide a continuous run of shields across the combined sections.

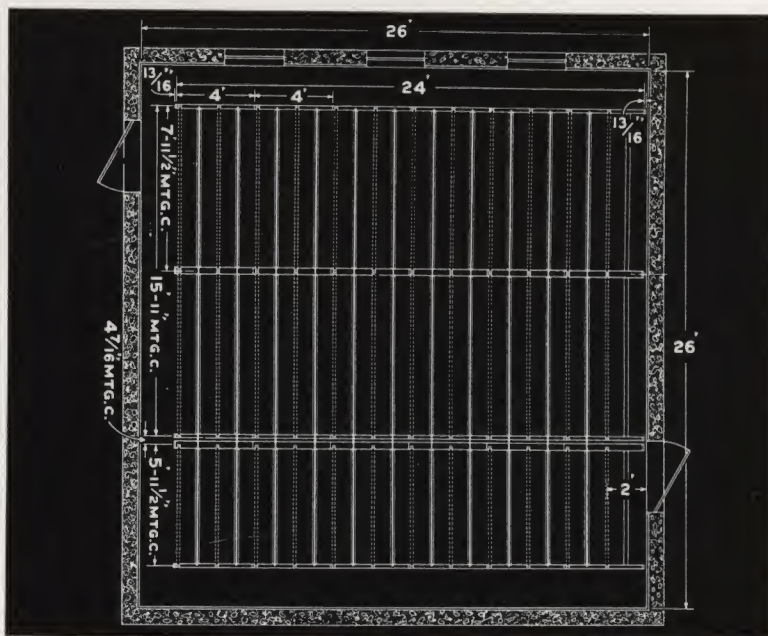
Parts List

Quantity	Description	Cat. No.
1	Room-size Lighting System (96" lamps)	G-1624-L or G-1624



Parts List

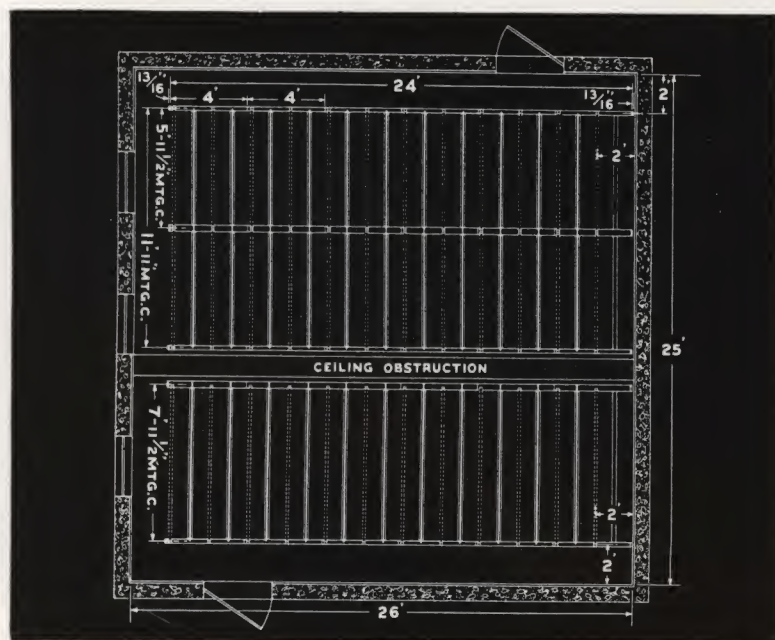
Quantity	Description	Cat. No.
6	4-lamp Section (96" lamps)	52104
6	2-lamp Section (72" lamps)	52202
11	Shield (connector type)	52450
11	Shield	52422
4	End Cap	52401
6	End Cap	52402
As required	Flexible Conduit Connector	52405



Typical "GRID-LITE" Layouts

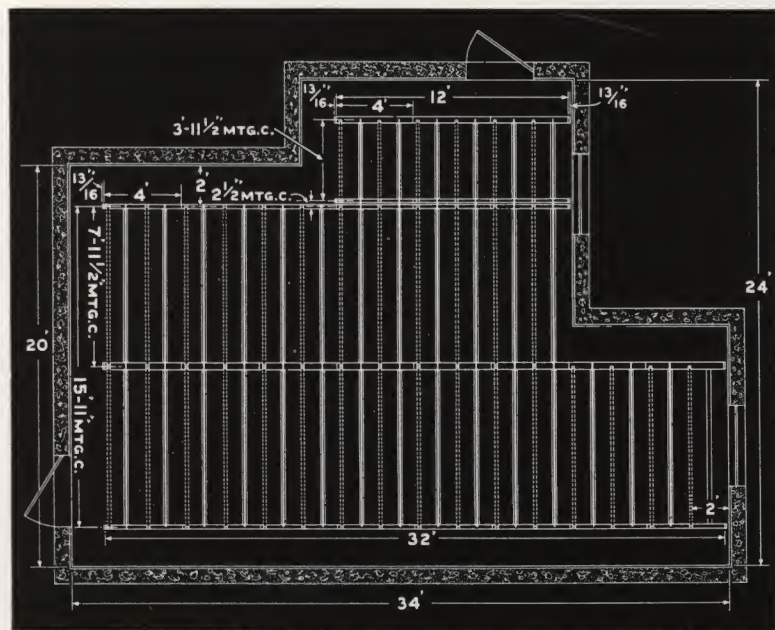
"Grid-Lite" systems are very flexible and can be laid out to fit practically any shape room as illustrated below. The upper layout shows "Grid-Lite" installed around a ceiling

obstruction such as a beam. The lower layout illustrates the method for handling an uncommon shaped room with two alcoves. All shield runs are continuous.



Parts List

Quantity	Description	Cat. No.
6	2-lamp Section (96" lamps)	52102
6	4-lamp Section (72" lamps)	52204
11	Shield	52420
11	Shield	52412
4	End Cap	52401
6	End Cap	52402
As Required	Flexible Conduit Connector	52405



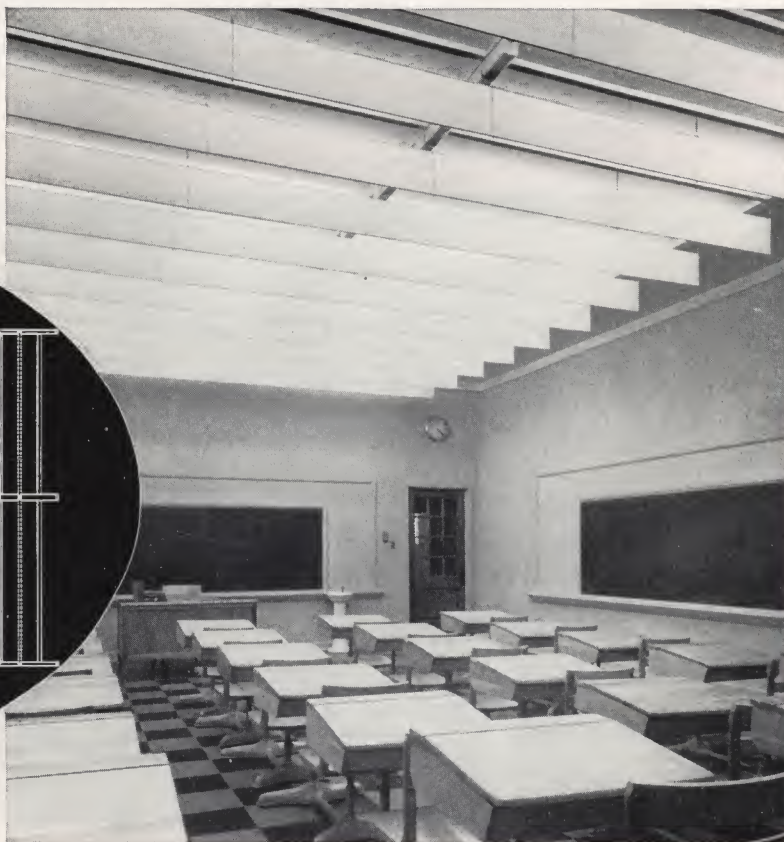
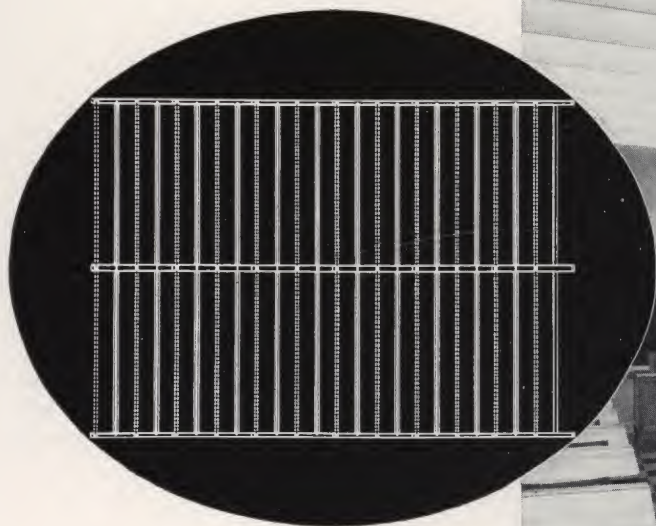
Parts List

Quantity	Description	Cat. No.
6	4-lamp Section (96" lamps)	52104
2	2-lamp Section (96" lamps)	52102
3	2-lamp Section (48" lamps)	52302
6	Shield (connector type)	52450
3	Shield	52420
6	Shield	52424
6	Shield	52410
4	End Cap	52401
6	End Cap	52402
As Required	Flexible Conduit Connector	52405

Schoolroom Size "GRID-LITE" Systems

for 96-inch T12 Slimline Lamps

The complete ROOM-SIZE lighting system below fits common Schoolroom Sizes and is available under ONE CATALOG NUMBER for easy ordering.



For Lighting: Schoolrooms • Offices • Stores • Display Rooms • Other Interiors of Approximate Size

This room-size system gives pre-determined ranges of foot-candle levels and eliminates the need for calculating, scaling, finding the number of lamps needed, etc.

One Catalog Number orders all parts (does not include lamps) needed to assemble a 16' x 24' "Grid-Lite" system. These dimensions allow it to fit a large number of common shapes and sizes of schoolrooms.

In a 24'8" x 32'0" room having recommended wall and ceiling finishes (75% maintenance factor), this "Grid-Lite" system with 200 MA ballasts and standard cool white lamps provides 35 foot-candles of high quality illumination. Under the same conditions, this "Grid-Lite" system with 425 MA ballasts provides 60 foot-candles of illumination.

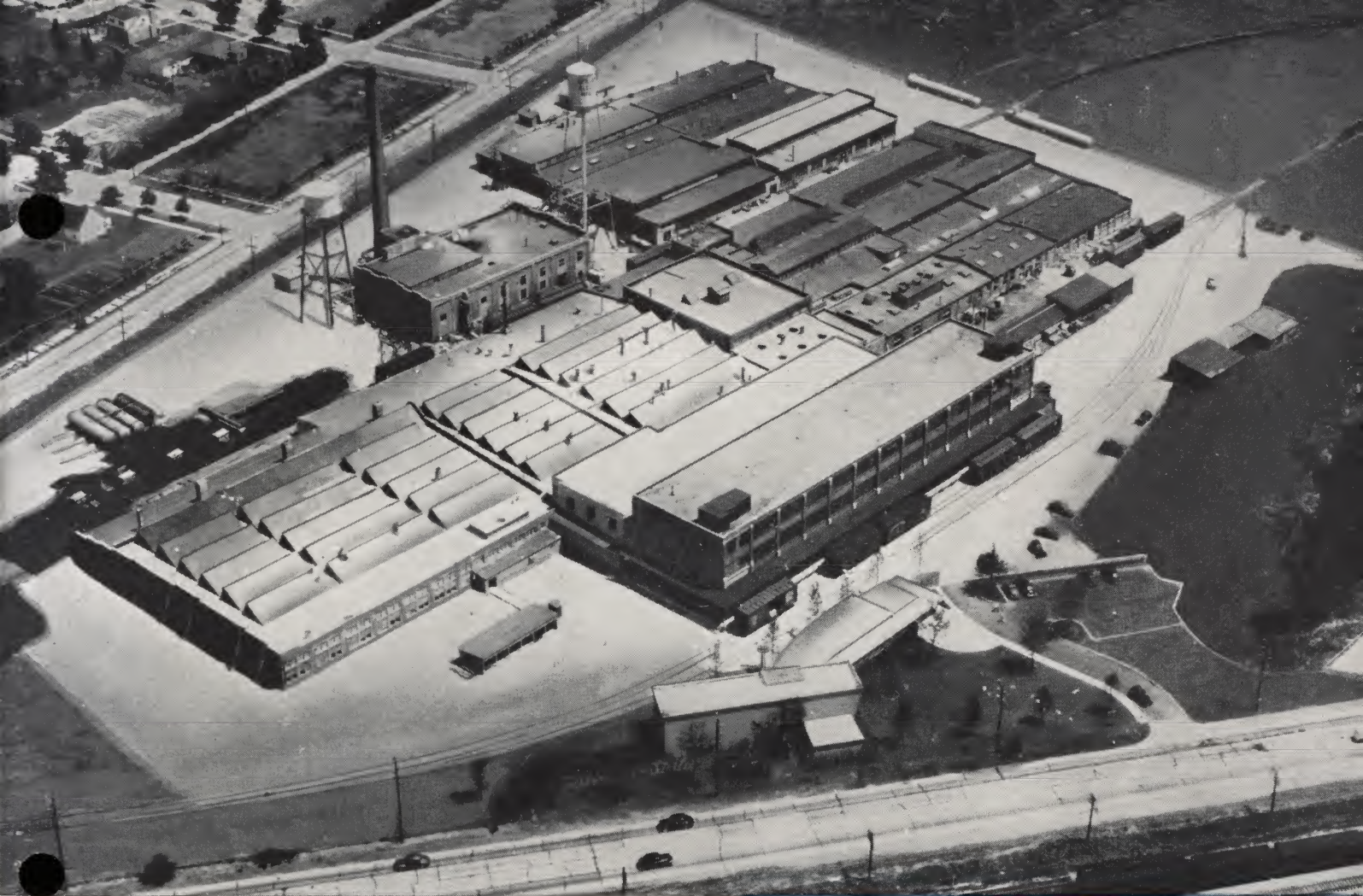
See the specification section for complete specifications on the component parts of these systems.

For those rooms with special shapes and sizes, "Grid-Lite" systems can be assembled from a combination of the "Unit Package" sections and parts.

SCHOOLROOM SIZE LIGHTING SYSTEM—Complete with Translucent Shields

Voltage (60 cycle)	Slimline Lamps	Number of Lamps	Nominal Dimensions in Feet	Description	Cat. No.
110-125V.	96", T12	24	16 x 24	With 200 MA Ballasts	G-1624-L
110-125V.	96", T12	24	16 x 24	With 425 MA Ballasts	G-1624

Lamps not Included



When You Specify "Benjamin," You Get the BENEFIT of a Half Century's Experience in Lighting

Benjamin Electric has been making Lighting Equipment for more than 50 years.

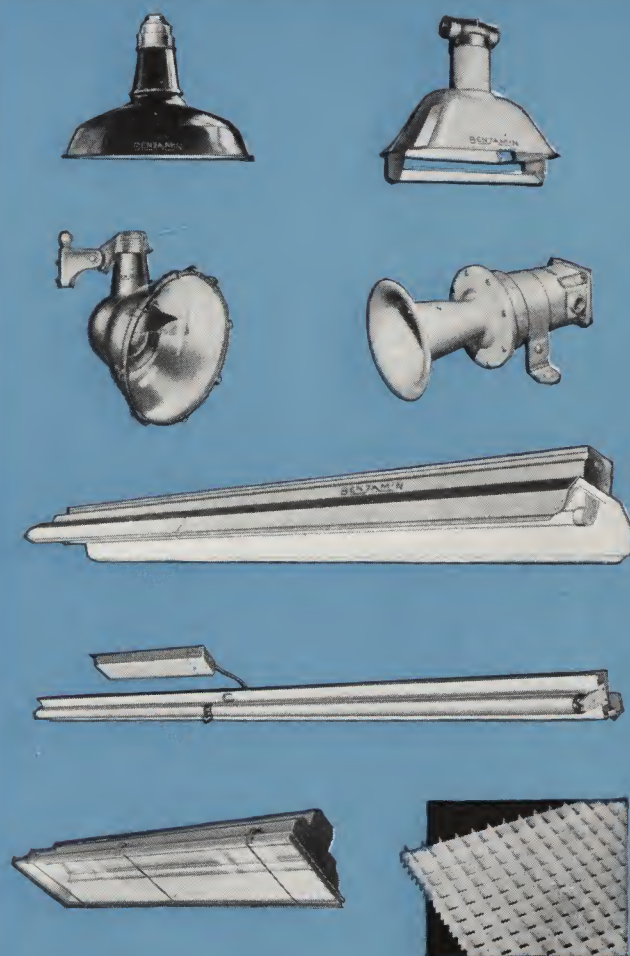
During that time, Benjamin solved innumerable lighting problems, set many lighting trends and built crack sales, engineering and production staffs—staffs that know lighting from A to Z.

Complete manufacturing facilities were set up permitting lighting equipment to be built from sheet steel to finished product under one roof. Excellent Quality Control systems were developed to function all along the production line.

Pride in craftsmanship has come naturally to Benjamin people. More than 28% of Benjamin employees have been with the Company 20 years or more and there is a very high percentage of "family teams."

More than fifty years has given Benjamin Electric time to build a complete line of lighting equipment that has set standards in the industry.

These are reasons why so many satisfied customers specify "Benjamin," time after time, whenever they need lighting equipment.



BENJAMIN ELECTRIC MFG. COMPANY

DES PLAINES, ILLINOIS

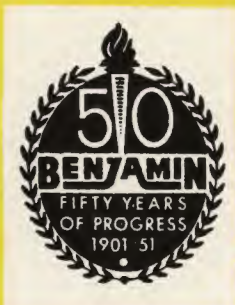
NEW YORK
230-34 W. 17th St.

CHICAGO
20 North Wacker Dr.

SAN FRANCISCO
829 Folsom St.

AD 5880 20M 5-52

Printed in U.S.A.



bulletin

sp

"Strip-Line"

fluorescent lighting system

BENJAMIN

• *Lighting Equipment*

one reason for BENJAMIN DEPENDABILITY

This is the Benjamin Development and Testing Laboratory. Much of the development work on the "Strip-Line" lighting system was carried on here.

The Laboratory has excellent facilities for the photometric, electrical and physical testing of all types of lighting equipment and accessories. Much quality control work is also handled here.

The Benjamin Company feels that such a laboratory enables it to give the customer the best in lighting equipment at the lowest cost—a policy with Benjamin for half a century.



Benjamin "Strip-Line" Lighting System

A Shallow, Compact Fluorescent Lighting System for Slimline and 40 Watt BiPin Lamps

Strip Sections Approved as Surface Metal Raceways by Underwriters' Laboratories, Inc.



Lighting applications: "Sky-Glo" lighting • general lighting • cornices • coves • shadow boxes • wall charts or murals • glass block lighting • silhouette lighting • show windows • wall cases • stock bins • aisles • passageways • low ceilings

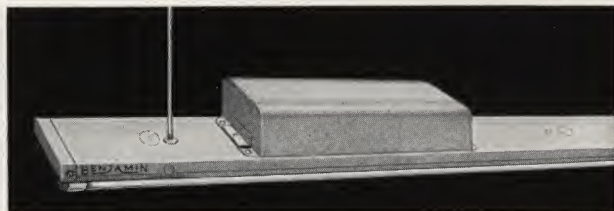
The Benjamin "Strip-Line" system is 1) simple and neat to wire; 2) compact; 3) shallow; 4) designed for mounting ballast either remotely or on top of strips; 5) designed so strips can be mounted in a vertical or horizontal position; 6) supplied for various types and sizes of fluorescent lamps.

No Soldering, Taping, or Wire Nuts Needed for Installation — Each "Strip-Line" section has a terminal block with screw terminals. Strip sections are supplied with lamp holders wired to these terminal blocks.

At the time of installation only line wires and ballast leads need be connected and these connections are made directly to the terminal blocks. This feature results in quicker, more economical installation.

Strips Connect End-to-End, No Couplings Needed — Both ends of "Strip-Line" sections have the unique Benjamin "Intra-Lok" design. This feature allows the ends of one strip section to lock directly to the ends of other strips — no couplings being needed.

Surface Mounting—"Strip-Line" system for 96-inch, T-12 slimline lamps plus Symmetrical Reflectors. Strips are attached directly to the ceiling. Remotely mounted ballasts are beside the channels.



Pendent Mounting—"Strip-Line" system suspended from ceiling by steel rods. Ballasts are mounted on top of the strips.

All Parts and Fittings Supplied for Complete Installation — Ballasts and all necessary parts and fittings, except lamps and suspensions, are supplied by Benjamin for a complete "Strip-Line" lighting system installation. These parts are designed to "go together" and provide maximum versatility and interchangeability in planning an installation.

Choice of Two Styles of Ballasts: Junction Box or Conventional — The Benjamin "Strip-Line" System is planned for use with either a junction box ballast (for remote mounting) or a conventional ballast (for top-of-strip mounting). For inconspicuous mounting in the open, all ballasts are attractively finished in baked white enamel.

"Strip-Line" Features and Specifications

Strip Sections and Covers — Approved as Surface Metal Raceways by Underwriters' Laboratories, Inc. They are formed of 19 gauge steel finished inside and out with baked, white enamel. Covers are easily removed by loosening two or three retaining screws and have a minimum reflection factor of 83%. All strips have the same cross section. Both ends of strip sections have special "Intra-Lok" design which locks directly to other strips. See pages 397 and 398 for dimensions and spacing and size of knockouts.

Allowable Number and Sizes of Wire for Strip Sections

Types—R, RH, RW, RU, T, TW, AVB

Wire Size AWG	Any Pendent Mounted Strip	Surface Mounted Strips for Bipin Lamps	Surface Mounted Strips for Slimline Lamps
14	10 wires	10 wires	10 wires
12	10 wires	8 wires	10 wires
10	10 wires	4 wires	8 wires

Plain End Cap — Used to close the end of a run of strips. Formed of 19 gauge steel finished in baked white enamel.

Junction Box End Cap and Junction Box Strip Connector — These two accessories are used to bring line wires into either the end or into the middle of surface mounted runs of "Strip-Line" sections. The end cap has three 1/2-inch iron pipe size knockouts, one in the end and one in each of its two sides; the strip connector has a 1/2-inch iron pipe size knockout in each of its two sides. Both accessories are formed of 19 gauge steel finished in baked white enamel and lock securely to strip sections by the unique "Intra-Lok" design.

Reflectors: Symmetrical and Asymmetrical — Symmetrical and Asymmetrical Reflectors are formed of 20 gauge steel finished inside and out with baked white enamel. Inside has minimum reflection factor of 83%. Each reflector has either two or three specially formed keyhole slots for attaching the reflector over covers of strip sections. All reflector sizes of any one type have the same cross section.

Terminal Block — Molded, phenolic block has brass screw terminals and is permanently attached to inside of strip.

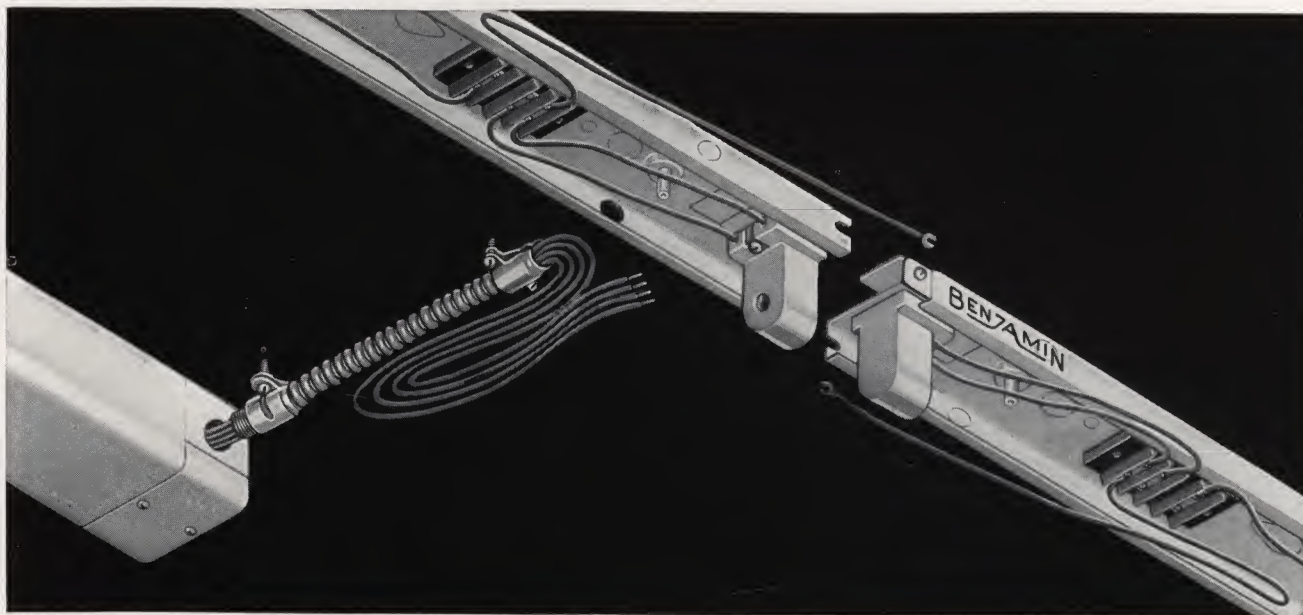
Ballasts — High power factor, brick type ballasts are supplied in two styles — junction box for remote mounting and conventional for top-of-strip mounting. Both styles are finished in baked white enamel and are supplied for bipin or slimline lamps, one and two-lamp operation. The junction box ballast has three 1/2-inch I. P. size knockouts in one end for ballast leads.

Junction box ballasts are supplied as standard with an 18-inch length of special 1/2-inch I. D. flexible steel conduit with two fittings for enclosing ballast leads from remote mounted ballast to strip section. Conventional ballasts include two mounting screws and nuts.

Lamp Holders — "Strip-Line" units for bipin lamps have conventional "tombstone" lamp holders. Units for slimline lamps have a rugged, telescoping, spring type lamp holder.

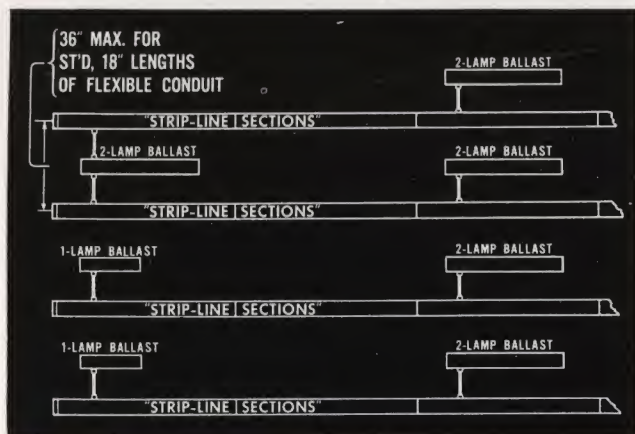
Wiring — "Strip-Line" strips are supplied completely wired except for line wires and ballast leads that are easily connected to the Terminal Block at the time of installation.

Lighting Data — Coefficients of Utilization for the "Strip-Line" system (with and without reflectors) are given on page 28A-1 of the Benjamin General Catalog.

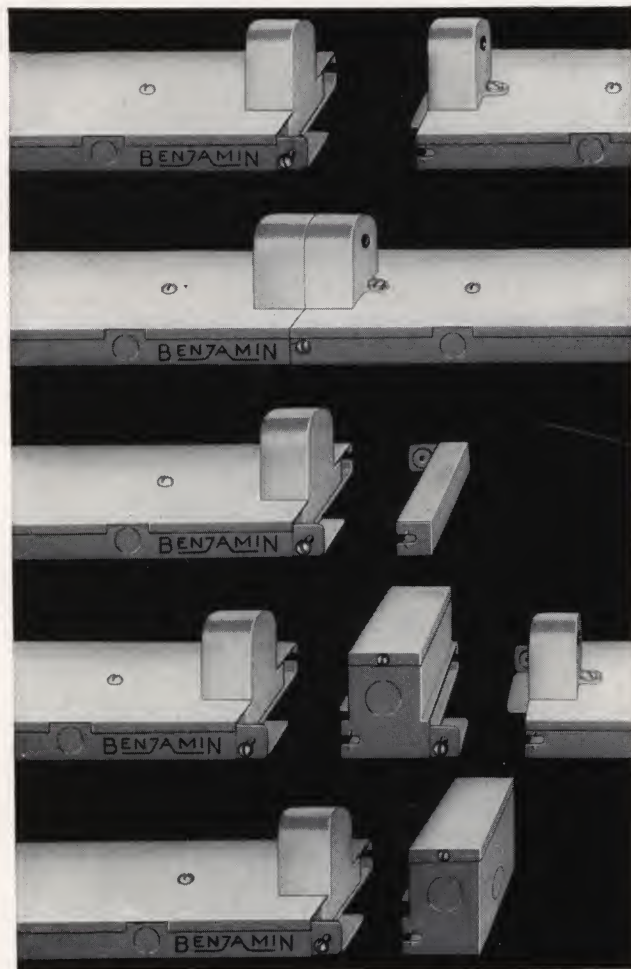


View shows part of two "Strip-Line" sections (for slimline lamps) ready to be surface mounted. Note terminal blocks that eliminate wire splicing; "Intra-Lok" construction that couples the two strips; and leads of remotely mounted ballast coming in to the knockout in side of strip section.

"Strip-Line" System Mounting Information



View shows two suggested ballast arrangements for surface mounted "Strip-Line" runs that have an odd-numbered strip section at the end of each run.



Top to Bottom—Two strips ready to be connected; Two strips locked together by means of "Intra-Lok" design; Strip with plain end cap; Strip with junction box connector; Strip with junction box end cap.

Since all "Strip-Line" sections have the same cross section, strip sections using different types and sizes of lamps may be locked end-to-end in any desired combination.

Each "Strip-Line" section is also the exact nominal length of the lamp that is used. Thus, to determine the required number of strips in a run when planning an installation, it is necessary only to divide the length of the space available by the nominal length of the desired lamp and then make small allowances for plain end caps and any junction box accessories that may be required. See pages 397 and 398 for dimensions.

Surface Mounting—The "Strip-Line" system can be attached directly to any flat surface such as ceilings, walls, etc. and in either a vertical or horizontal position.

Two or four 7/32-inch knockouts are provided in the top of each strip for use with mounting screws, toggle bolts or "powder-driven" studs. This permits "Strip-Line" to be mounted on solid or hollow ceilings of all types and materials.

When Surface Mounted, the "Strip-Line" system ballasts are mounted beside the strip or strips (at the end with the terminal block) to which it belongs. An 18-inch length of special 1/2-inch, flexible steel conduit plus two fittings are provided which enclose the ballast leads from the junction box type ballast into the knockout in the side of the strip section.

Line wires are brought into the ends of strip section runs through knockouts in the junction box end caps and into the middle of strip runs through knockouts in the junction box strip connector.

For location and size of all knockouts, see dimension diagrams on pages 397 and 398.

Pendent Mounting—The "Strip-Line" system can also be suspended any distance from 3 1/2 inches or more (when ballasts are mounted on top of strips) below ceilings by rigid conduit or by steel rods.

For this purpose, strips have two to four 1/2-inch iron pipe size knockouts and the two or four 7/32-inch knockouts mentioned under "Surface Mounting" above.

When strips are pendent mounted, the conventional style ballasts are commonly mounted on top of the strips using the 17/64-inch knockout and teardrop shaped knockout provided. Two screws and nuts for fastening the ballast down are also provided. Ballast leads are brought directly into the top of the strip through the teardrop shaped knockout which is near the terminal block.

Line wires are brought into strip runs through the knockouts in junction box end caps, junction box strip connectors or through available knockouts in the tops of the strips.

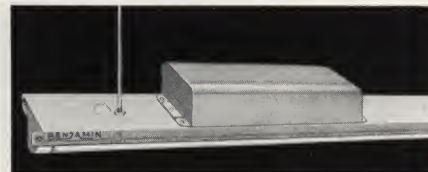
For location and size of all knockouts, see dimension diagrams on pages 397 and 398.

"Strip-Line" for T-12 Slimline Lamps

Strip Sections Approved as Surface Metal Raceways by Underwriters' Laboratories, Inc.



Junction Box Style Ballast Mounted Remotely.



Conventional Style Ballast Mounted on Top of Strip

SINGLE-LAMP-STRIP ASSEMBLY WITH SINGLE-LAMP, H.P.F. BALLAST (WITHOUT END CAPS) †

For remote mounting of junction box ballast—for 110-125V., 60 cycle operation

Lamp Length (Nominal)	Strip Section Length	Approx. Lamp Current	Approx. Lamp Watts	Total Power Consumption	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts		
								Strip Only	Ballast Only	18" Flex. Cond. & Fittings
48-inch	48"	430MA.	40	58W.	10¼	151148	\$25.60	51148	2148	1140
72-inch	72"	430MA.	56	78W.	18¼	151172	33.60	51172	2172	1140
96-inch	96"	430MA.	75	96W.	25¾	151196	36.00	51196	2196	1140

For top-of-strip mounting of conventional ballast—for 110-125V., 60 cycle operation

48-inch	48"	430MA.	40	58W.	9½	251148	\$22.90	51148	1948‡	....
72-inch	72"	430MA.	56	78W.	17½	251172	30.90	51172	1972‡	....
96-inch	96"	430MA.	75	96W.	25	251196	33.30	51196	1996‡	....

TWO SINGLE-LAMP-STRIP ASSEMBLY WITH TWIN-LAMP, H.P.F. BALLAST (WITHOUT END CAPS) †

For remote mounting of junction box ballast—for 110-125V., 60 cycle operation

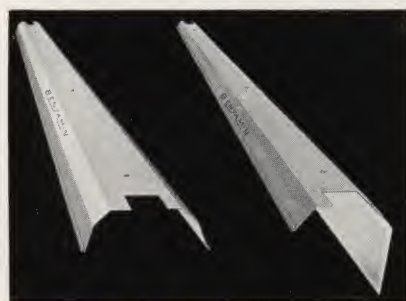
Lamp Length (Nominal)	Strip Section Length	Approx. Lamp Current	Approx. Lamp Watts	Total Power Consumption	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts		
								Strip Only	Ballast Only	18" Flex. Cond. & Fittings
48-inch	2-48"	430MA.	2-40	100W.	22¼	151248	\$35.60	two 51148	2248	1140
72-inch	2-72"	430MA.	2-56	132W.	31¾	151272	49.00	two 51172	2272	1140
96-inch	2-96"	430MA.	2-75	174W.	40	151296	54.00	two 51196	2296	1140

For top-of-strip mounting of conventional ballast—for 110-125V., 60 cycle operation

48-inch	2-48"	430MA.	2-40	100W.	21½	251248	\$32.90	two 51148	2048‡	....
72-inch	2-72"	430MA.	2-56	132W.	31	251272	46.30	two 51172	2072‡	....
96-inch	2-96"	430MA.	2-75	174W.	39¼	251296	51.30	two 51196	2096‡	....

‡ Includes two mounting screws and nuts.

† Lamps not included.



Left—Cat. No. 50448

Right—Cat. No. 50548

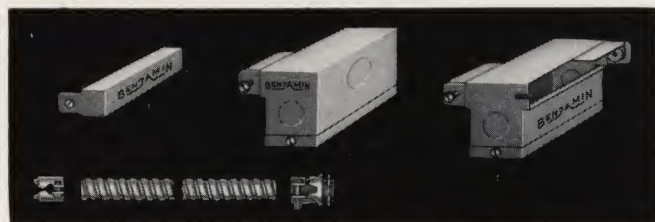
REFLECTORS — Attach to Strip Covers and must be ordered separately, one for each lamp.

Description	Net Wt. Lbs. Ea.	Cat. No.	List Price
Symmetrical (Baked white Enam. steel, 48")	4	50448	\$2.40
Symmetrical (Baked white Enam. steel, 72")	6	50872	3.60
Symmetrical (Baked white Enam. steel, 96")	8	50896	4.80
Asymmetrical (Baked white Enam. steel, 48")	4½	50548	3.20
Asymmetrical (Baked white Enam. steel, 72")	7	50972	4.00
Asymmetrical (Baked white Enam. steel, 96")	9	50996	5.20

FITTINGS AND REPLACEMENT PARTS

Description	Net Wt. Lbs. Ea.	Cat. No.	List Price
Plain End Cap	⅛	50901	\$0.50
Junction Box End Cap	½	50902	1.50
Junction Box Strip Connector	½	50905	1.80
18-in. Ballast-to-Strip flex. conduit assembly	¾	1140	1.20
Flexible Conduit Entrance Fitting for Ballast	⅛	50911	.40
Flexible Conduit Entrance Fitting for Strip	⅛	50910	.20
Flexible Conduit, 18-inch Length*	½	50915	.60

* Special lengths of this flexible conduit can be supplied in 2', 3', 4' or any even foot length at \$.50 list per foot.



Top row: Cat. No. 50901; Cat. No. 50902; Cat. No. 50905.

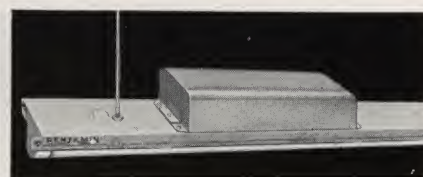
Bottom row: Cat. No. 1140.

"Strip-Line" for T-8 Slimline Lamps

Strip Sections Approved as Surface Metal Raceways by Underwriters' Laboratories, Inc.



Junction Box Style Ballast Mounted Remotely.



Conventional Style Ballast Mounted on Top of Strip

SINGLE-LAMP-STRIP ASSEMBLY WITH SINGLE-LAMP, H.P.F. BALLAST (WITHOUT END CAPS) † For remote mounting of junction box ballast—for 110-125V., 60 cycle operation

Lamp Length (Nominal)	Strip Section Length	Approx. Lamp Current	Approx. Lamp Watts	Total Power Consumption	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts		
								Strip Only	Ballast Only	18" Flex. Cond. & Fittings
72-inch	72"	200MA.	37	48W.	16¾	152172	\$30.40	51172	3172	1140
96-inch	96"	200MA.	49	66W.	20¼	152196	32.80	51196	3196	1140

For top-of-strip mounting of conventional ballast—for 110-125V., 60 cycle operation

72-inch	72"	200MA.	37	48W.	16	252172	\$27.70	51172	2972‡	....
96-inch	96"	200MA.	49	66W.	19½	252196	30.10	51196	2996‡	....

TWO SINGLE-LAMP-STRIP ASSEMBLY WITH TWIN-LAMP, H.P.F. BALLAST (WITHOUT END CAPS) † For remote mounting of junction box ballast—for 110-125 V., 60 cycle operation

Lamp Length (Nominal)	Strip Section Length	Approx. Lamp Current	Approx. Lamp Watts	Total Power Consumption	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts		
								Strip Only	Ballast Only	18" Flex. Cond. & Fittings
72-inch	2-72"	200MA.	2-37	98W.	25¾	152272	\$44.40	two 51172	3272	1140
96-inch	2-96"	200MA.	2-49	122W.	34¾	152296	49.60	two 51196	3296	1140

For top-of-strip mounting of conventional ballast—for 110-125V., 60 cycle operation

72-inch	2-72"	200MA.	2-37	98W.	25	252272	\$41.70	two 51172	3072‡	....
96-inch	2-96"	200MA.	2-49	122W.	34	252296	46.90	two 51196	3096‡	....

‡ Includes two mounting screws and nuts.

† Lamps not included.



Left—Cat. No. 50872

Right—Cat. No. 50972

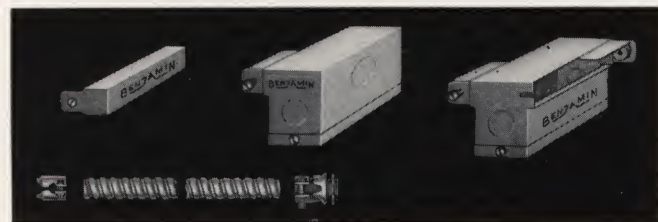
REFLECTORS — Attach to Strip Covers and must be ordered separately, one for each lamp.

Description	Net Wt. Lbs. Ea.	Cat. No.	List Price
Symmetrical (Baked white Enam. steel, 72")	6	50872	\$3.60
Symmetrical (Baked white Enam. steel, 96")	8	50896	4.80
Asymmetrical (Baked white Enam. steel, 72")	7	50972	4.00
Asymmetrical (Baked white Enam. steel, 96")	9	50996	5.20

FITTINGS AND REPLACEMENT PARTS

Description	Net Wt. Lbs. Ea.	Cat. No.	List Price
Plain End Cap	⅛	50901	\$0.50
Junction Box End Cap	½	50902	1.50
Junction Box Strip Connector	½	50905	1.80
18-in. Ballast-to-Strip flex. conduit assembly	¾	1140	1.20
Flexible Conduit Entrance Fitting for Ballast	⅛	50911	.40
Flexible Conduit Entrance Fitting for Strip	⅛	50910	.20
Flexible Conduit, 18-inch Length*	½	50915	.60

* Special lengths of this flexible conduit can be supplied in 2', 3', 4' or any even foot length at \$0.50 list per foot.



Top row: Cat. No. 50901; Cat. No. 50902; Cat. No. 50905.
Bottom row: Cat. No. 1140.

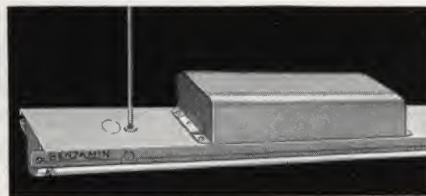
"Strip-Line" for 40 Watt, Bipin Lamps

Strips and Reflectors (Fittings and Replacements Parts are listed on page 394)

Strips Approved as Surface Metal Raceways by Underwriters' Laboratories, Inc.



Junction Box Style Ballast Mounted Remotely.



Conventional Style Ballast Mounted on Top of Strip

SINGLE-LAMP-STRIP ASSEMBLY WITH SINGLE-LAMP, H.P.F. BALLAST (WITHOUT END CAPS) †

For remote mounting of junction box ballast—for 110-125 V., 60 cycle operation

Lamp Length (Nominal)	Length of Strip	Approx. Lamp Watts	Total Power Consumption	Starters	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts		
								Strip Only	Ballast Only	18" Flex. Cond. and Fittings
48-inch	48"	40	52W.	Standard	9¾	150148	\$18.20	50148	1148	1140
48-inch	48"	40	52W.	Nonblink	9¾	150148-W	18.90	50148-W	1148	1140

For top-of-strip mounting of conventional ballast—for 110-125 V., 60 cycle operation

48-inch	48"	40	52W.	Standard	9	250148	\$15.50	50148	948‡	....
48-inch	48"	40	52W.	Nonblink	9	250148-W	16.20	50148-W	948‡	....

96-INCH STRIP FOR TWO 48-INCH LAMPS WITH TWIN-LAMP, H.P.F. BALLAST (WITHOUT END CAPS) †

For remote mounting of junction box ballast—for 110-125 V., 60 cycle operation

Lamp Length (Nominal)	Length of Strip	Approx. Lamp Watts	Total Power Consumption	Starters	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts		
								Strip Only	Ballast Only	18" Flex. Cond. and Fittings
48-inch	96"	2-40	97W.	Standard	18¾	150248	\$26.60	50248	1248	1140
48-inch	96"	2-40	97W.	Nonblink	18¾	150248-W	28.00	50248-W	1248	1140

For top-of-strip mounting of conventional ballast—for 110-125 V., 60 cycle operation

48-inch	96"	2-40	97W.	Standard	18	250248	\$23.90	50248	1048‡	....
48-inch	96"	2-40	97W.	Nonblink	18	250248-W	25.30	50248-W	1048‡	....

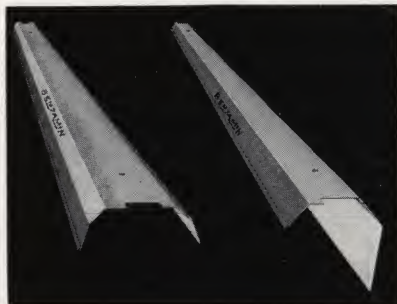
TWO SINGLE-LAMP-STRIP ASSEMBLY WITH TWIN-LAMP, H.P.F. BALLAST (WITHOUT END CAPS) †

For remote mounting of junction box ballast—for 110-125 V., 60 cycle operation

Lamp Length (Nominal)	Length of Strip	Approx. Lamp Watts	Total Power Consumption	Starters	Net Wt. Lbs. Ea.	Cat. No.	List Price	Consisting Parts		
								Strip Only	Ballast Only	18" Flex. Cond. and Fittings
48-inch	2-48"	2-40	97W.	Standard	15¾	150348	\$27.60	two 50148	1248	1140
48-inch	2-48"	2-40	97W.	Nonblink	15¾	150348-W	29.00	two 50148-W	1248	1140

For top-of-strip mounting of conventional ballast—for 110-125 V., 60 cycle operation

48-inch	2-48"	2-40	97W.	Standard	15	250348	\$24.90	two 50148	1048‡	....
48-inch	2-48"	2-40	97W.	Nonblink	15	250348-W	26.30	two 50148-W	1048‡	....



Left—Cat. No. 50848

Right—Cat. No. 50948

‡ Includes two mounting screws and nuts.

† Lamps not included.

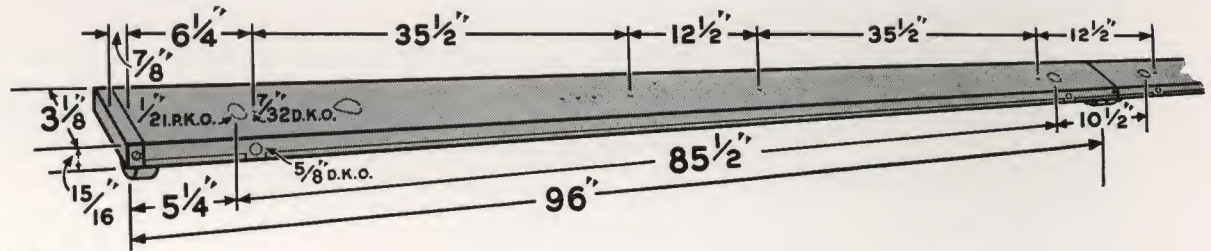
REFLECTORS* — Attach to Strip Covers and must be ordered separately, one for each lamp.

Description	Net Wt. Lbs. Ea.	Cat. No.	List Price
Symmetrical (Baked white enam. steel, 48")	4	50848	\$2.40
Asymmetrical (Baked white enam. steel, 48")	4½	50948	3.20

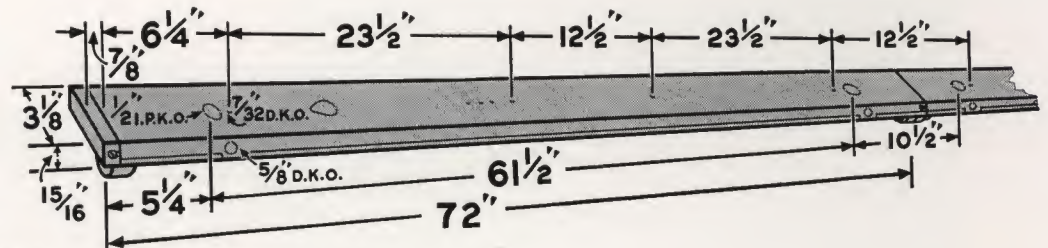
* Fittings and Replacement Parts listed on page 394.

"Strip-Line" for T-12 & T-8 Slimline Lamps

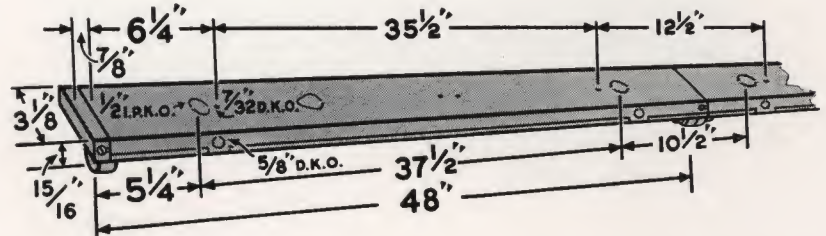
Dimensional Data for "Strip-Line" systems listed on pages 394 and 395



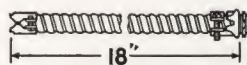
For T-12 & T-8
96-inch lamps



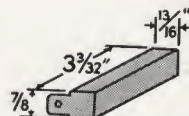
For T-12 & T-8
72-inch lamps



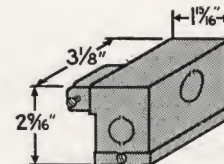
For T-12
48-inch lamps



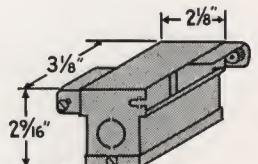
Cat. No. 1140—Flexible
Conduit with fittings



Cat. No. 50901—Plain
End Cap

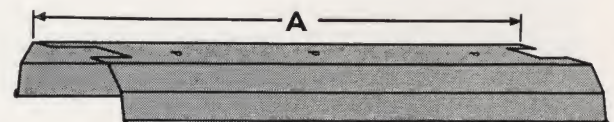
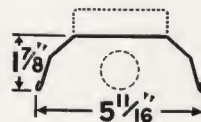


Cat. No. 50902—Junction
Box End Cap

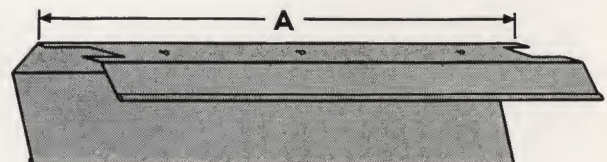
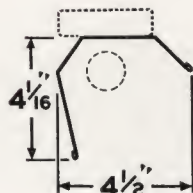


Cat. No. 50905—Junction
Box Strip Connector

Cat. No.	Dim. A
50448	48-inches
50872	72-inches
50896	96-inches



Symmetrical Angle Reflector



Asymmetrical Angle Reflector

Cat. No.	Dim. A
50548	48-inches
50972	72-inches
50996	96-inches

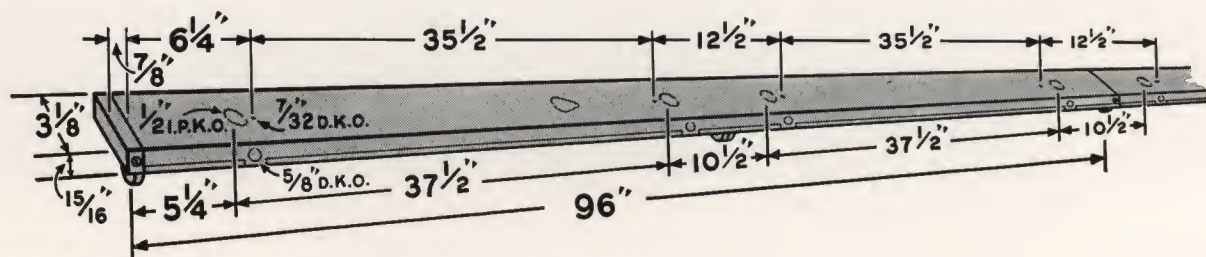
(Issued September 11, 1950)

BENJAMIN • page 397

(From General Catalog)

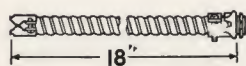
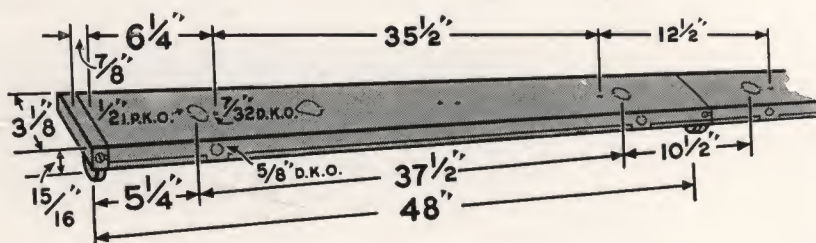
"Strip-Line" for 40 Watt, Bipin Lamps

Dimensional Data for "Strip-Line" systems listed on page 396

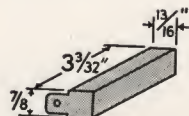


96-inch strip for two 48-inch lamps

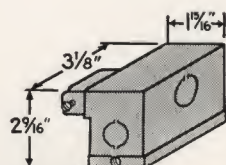
Single-Lamp-Strip for one 48-inch lamp



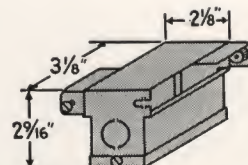
Cat. No. 1140—Flexible conduit with fittings



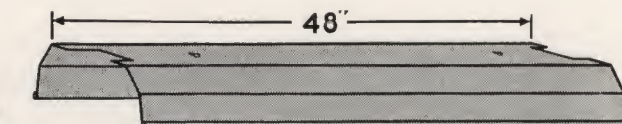
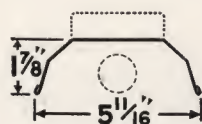
Cat. No. 50901—Plain End Cap



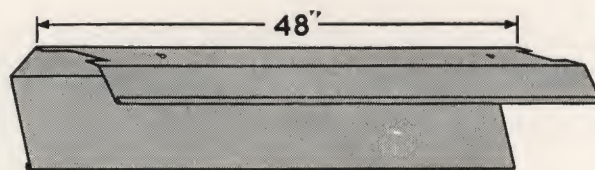
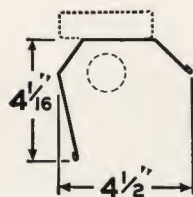
Cat. No. 50902—Junction Box End Cap



Cat. No. 50905—Junction Box Strip Connector



Cat. No. 50848—Symmetrical Angle Reflector

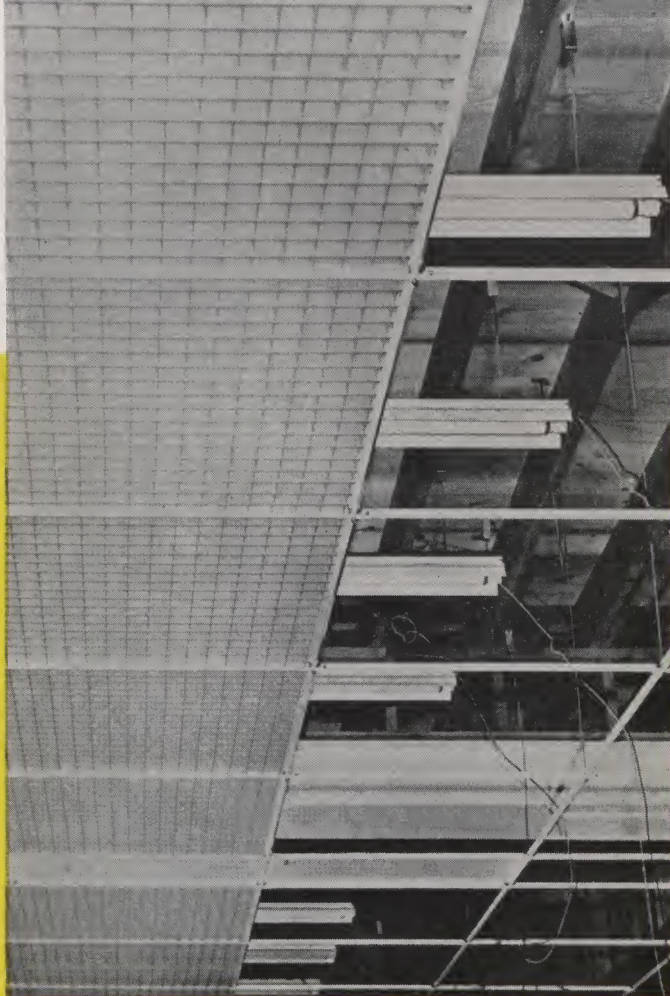


Cat. No. 50948—Asymmetrical Angle Reflector

SKY-GLO* plus **STRIP-LINE**

a BENJAMIN ENGINEERED
lighting team

* For information on how "Sky-Glo" can Modernize
Interiors as well as solve Relighting problems, write
to: Benjamin Electric Mfg. Company, Des Plaines,
Illinois.



Progress picture of a SKY-GLO and STRIP-LINE installation

Finished installation of same store shown above



BENJAMIN ELECTRIC MFG. COMPANY

DES PLAINES, ILLINOIS

NEW YORK
230-34 W. 17th St.

CHICAGO
20 North Wacker Dr.

SAN FRANCISCO
829 Folsom St.

AD 5706 15M 7-50

Printed in U.S.A.



Do You Need More Information?

The following Benjamin Literature is available on request.

Bound Catalog

Registered Looseleaf Catalog

"le" Bulletin—Lighting Equipment for Commerce and Industry

"mf" Bulletin—Lighting Equipment for Slimline Fluorescent Lamps

"sp" Bulletin—"Strip-Line" Fluorescent Lighting System

"pl" Bulletin—Price List Applying to the Benjamin General Catalog

A Planning Guide to Improved Plant Lighting

"ld" Bulletin—Manual of Lighting Application Data

"fp" Bulletin—Guide to Modern Factory Lighting Practice

Planned Lighting Equipment Selection Guide

"sl" Bulletin—What Every Service Station Operator Should Know About Lighting

"is" Bulletin—Scrapbook of Service Station Improvements

"SKY-GLO" Luminous Louver Lighting System Bulletin

"fe" Bulletin—Benjamin Fluorescent Lighting Systems for Industrial and Commercial Locations

"fl" Bulletin—Floodlighting Equipment for Industry and Commerce

"te" Bulletin—Turnlox Lighting Equipment

"ml" Bulletin—Mercury Lamp Equipment and Lighting Data

"sd" Bulletin—Benjamin Signal Devices for Calling and Warning

"lp" Bulletin—Protective Lighting

Other Benjamin Products



Do You Need More Information?

The following Benjamin Literature is available on request.

Bound Catalog

Registered Looseleaf Catalog

"sl" Bulletin—What Every Service Station Operator
Should Know About Lighting

"ie" Bulletin—Service Station Improve-

System Bulletin
Lighting Systems for
Commercial Locations
Plant for Industry and

ment
ent and Lighting
es for Calling and



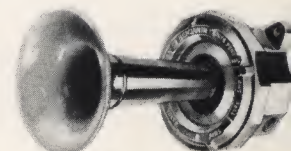
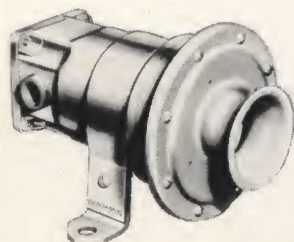
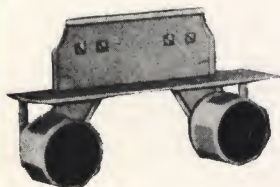
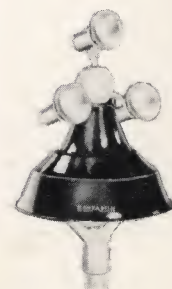
Digitized by

The Association for Preservation Technology International

For the

Building Technology Heritage Library

<http://archive.org/details/buildingtechnologyheritagelibrary>



BENJAMIN ELECTRIC MFG. COMPANY

DES PLAINES, ILLINOIS

NEW YORK
230-34 W. 17th St.

CHICAGO
20 North Wacker Dr.

SAN FRANCISCO
829 Folsom St.

